

2018 PIERCE ENFORCER



Pierce
ENFORCER



Revised 2/11/2020



This document and additional reference documents regarding this breed of apparatus are available at:

<https://www.montgomerycountymd.gov/mcfrs-psta/driver/DriverTrainingPierceEnforcer.html>

Key Differences - Crimson vs. Pierce



- No Compressed Air Foam System (CAFS)
 - No compressor
- No rotary vane primer or selector lever for intake priming
- No AC generator or power inverter
 - 12v DC scene lights
- No Class B foam cell
- No AutoFill on any intake
- No pressure relief valve on large diameter discharges
- Manual valve on the tank-to-pump

Dimensions & Weight



- Overall height: 9' 6"
- Overall width:
 - 8' 9 ½" cab step to cab step
 - 9' 9" mirror to mirror
- Overall length: 30' 1"
 - bumper to Federal Q siren
- Actual Weight – December 2019
 - Engine 722 fully equipped with all tanks full and no personnel onboard
 - ✓ Front axle – 15,360lbs
 - ✓ Rear axle – 24,500lbs
 - ✓ Both axles on scale – 40, 240lbs

Beware that the cab entry steps protrude from the body



Safety Systems



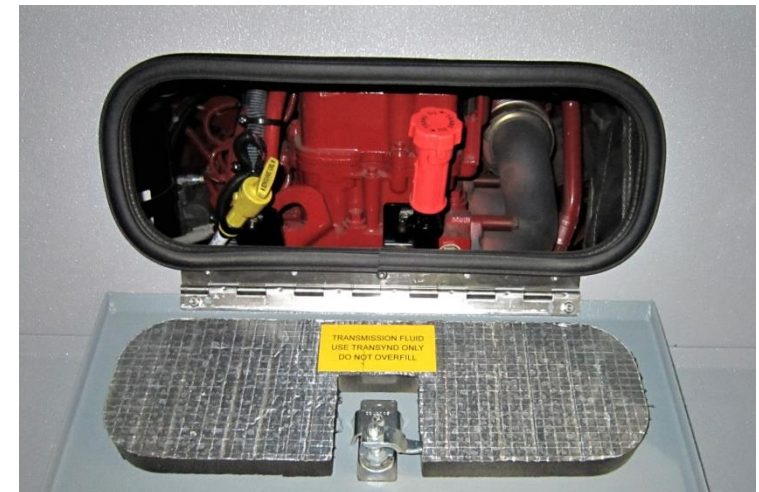
- **Automatic Traction Control (ATC)**
 - applies the service brake to a spinning wheel so that the torque can be transferred through the differential to the wheel that has the traction
 - reduces engine torque when both wheels are spinning to improve traction
 - ATC light located in the cab will light when the ATC feature is active
 - May be momentarily disengaged by “Offroad Traction” switch
- **Electronic Stability Control (ESC)**
 - stabilizes the vehicle during cornering maneuvers
 - Compares where you are steering and where the vehicle is actually going
 - Intervenes by applying the brakes to individual wheels asymmetrically in order to create torque about the vehicle's vertical axis
 - system may reduce engine power or operate the transmission to slow the vehicle down
- **Frontal impact protection systems**
- **Side roll protection systems**

See the [Pierce Saber/Enforcer Operator's Manual](#) for additional information.

Powertrain Systems



- Motor: Cummins L9 450hp
- Transmission: Allison 4000 EVS 5-speed
 - TES-295 synthetic fluid
- Maximum speed is 68mph
- Motor oil and transmission fluid checks via access panel crew area of cab
- Transmission level is also checked via the keypad



Transmission Fluid



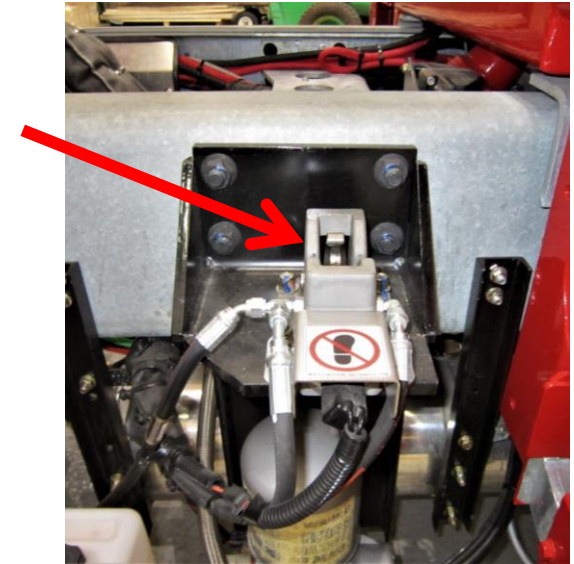
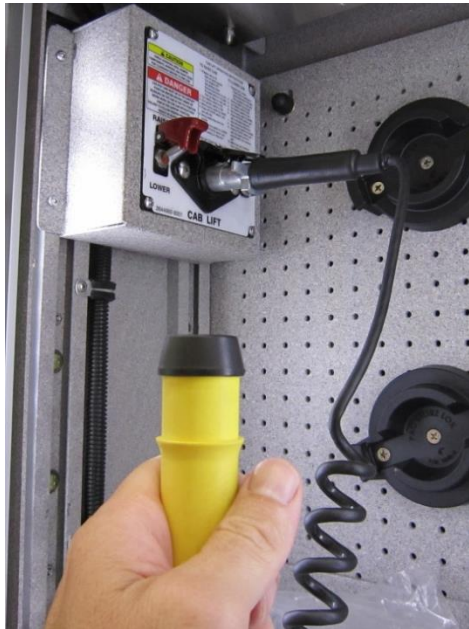
- Fluid level check
 - Selector in Neutral
 - Temperature 140 to 220°F
 - Engine at idle and parked for >2 minutes
 - Level ground
- Press both arrow buttons simultaneously to check fluid level; status displayed on selector pad screen
- OL will be followed by OK, -1 thru -7, or +1 thru +7.
 - The – indicates under filled and the + indicates overfilled.
 - The numeral indicates the number of quarts.
- Any other message indicates a problem and CMF should be notified.
- Always confirm the digital reading by visually checking the dipstick BEFORE adding fluid.



Cab Tilt



- Cab locks are not easily visible nor is there is a discernible sound to verify engagement
 - Control located in the first driver's side body compartment
 - Two options:
 - Use the handheld controller
 - Use the toggle switch on the control box (useful if the handheld is lost or malfunctioning)



Cab lock mechanism – forward of pump housing

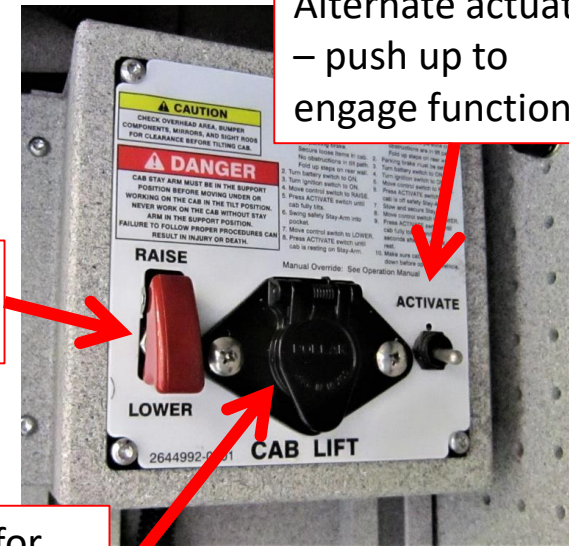
Always secure loose items in the cab and verify clearances BEFORE tilting the cab!

Cab Tilt



1. Turn on battery and ignition switch
2. Secure loose items in the cab
3. Verify overhead and forward clearances
4. Select function using “raise/lower” switch
 - Switch with red cover
5. Plug in handheld cab tilt actuator
 - Serves single function – to activate the function selected
6. Position to view the area around and ahead of the cab
7. Engage the raise/lower function by pressing the actuator button

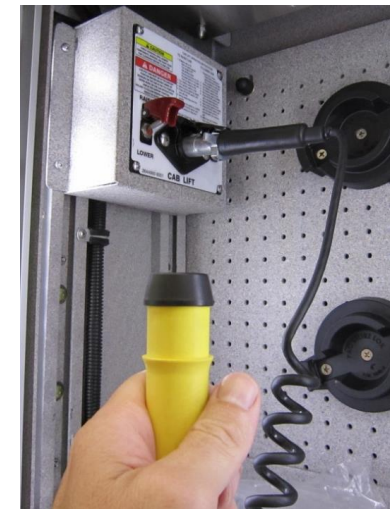
If the handheld actuator is not available, the toggle switch marked “activate” serves the same purpose



Raise/lower selector

Alternate actuator – push up to engage function

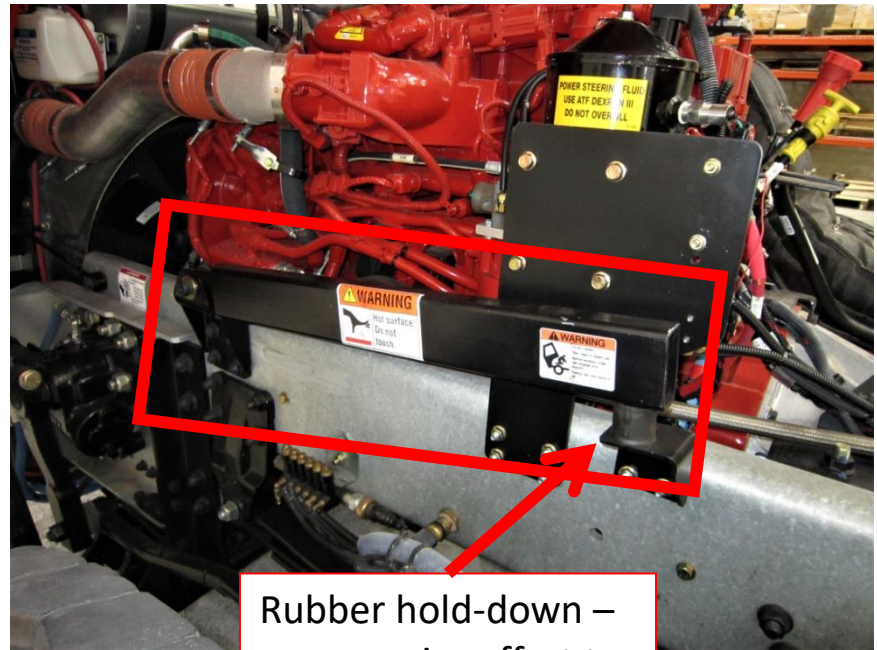
Plug for handheld actuator



Cab Tilt – Safety Arm



- Locking safety arm located on driver's side lift cylinder
- Stowed atop the frame rail beside the motor
 - Metal becomes **HOT** as motor compartment heats up – use gloves to handle
 - No cables to pull or latches to operate
 - Held down by a rubber stopper during storage

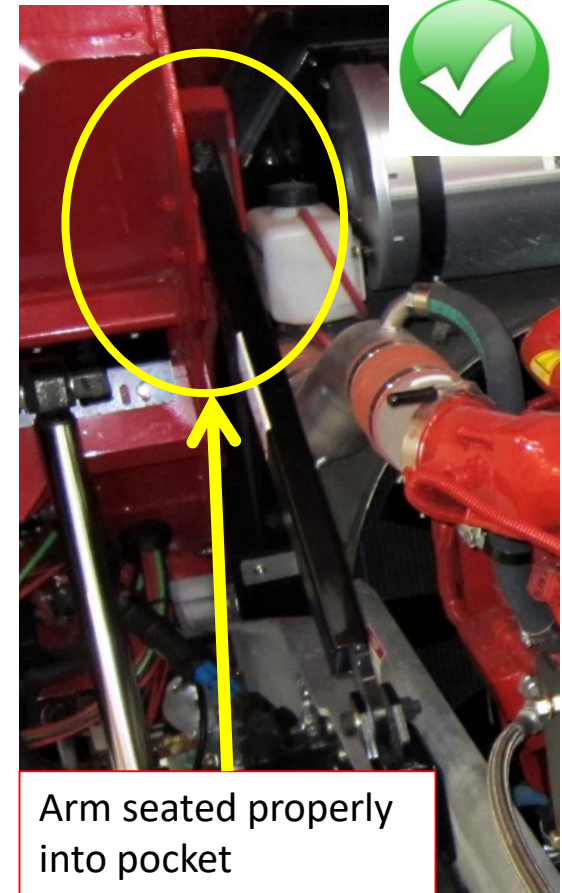
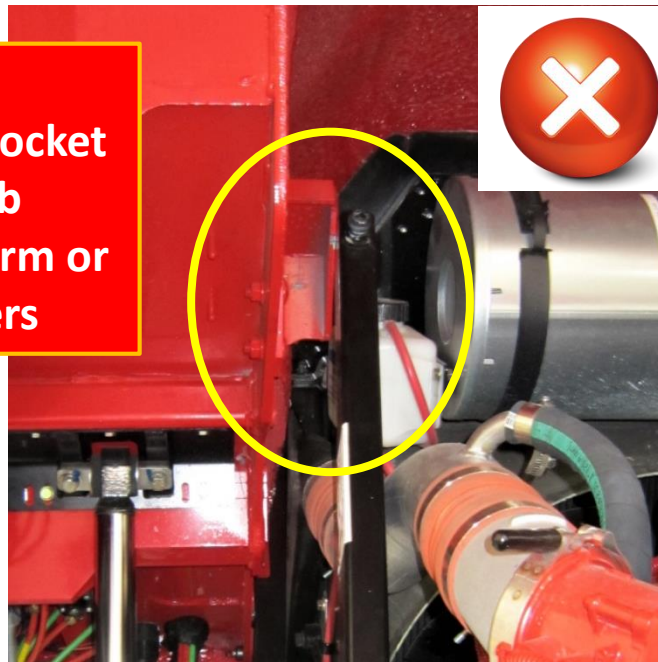


Rubber hold-down – may require effort to dislodge from storage

Cab Tilt – Safety Arm

- Drops into a pocket ahead of the wheel well
 - Be sure to verify the arm lands in the pocket – hinge has a loose tolerance and may let the arm fall outside

DANGER
Arm is not in the pocket
Not holding the cab
May damage the arm or cab if the cab lowers



Cab Tilt

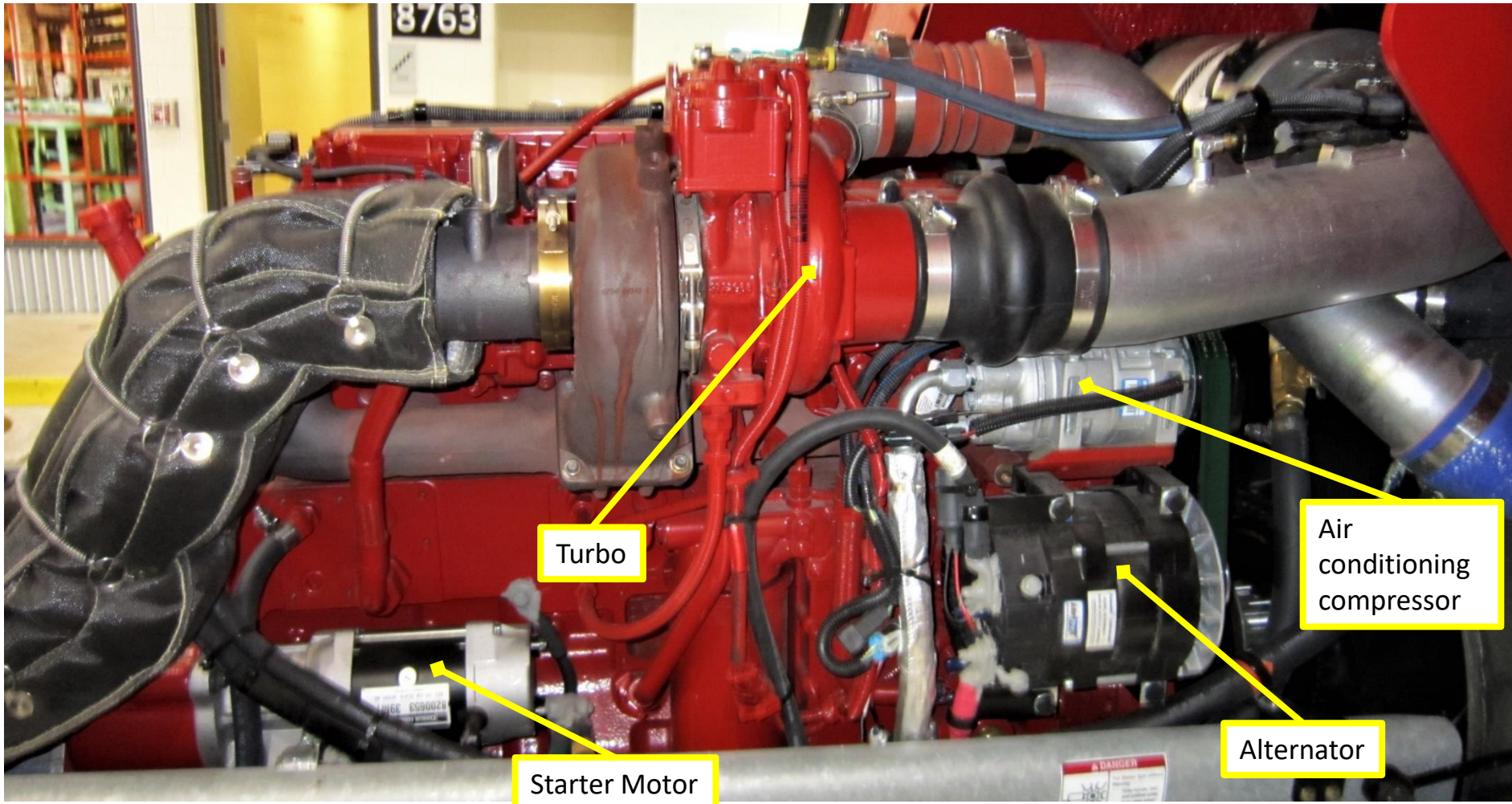


Always...verify clearances, secure loose items, and engage the safety arm

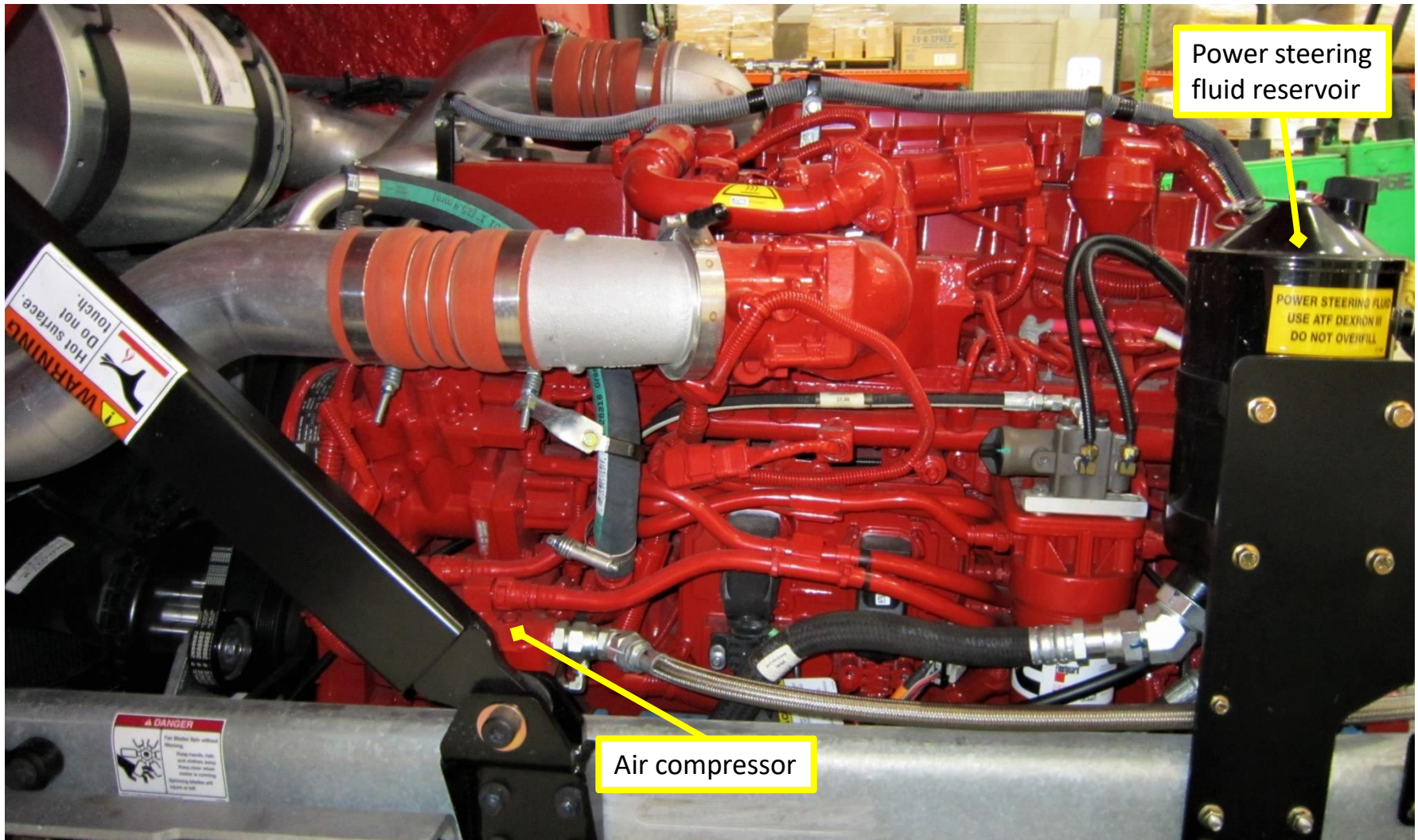


Watch the clearance of this mirror

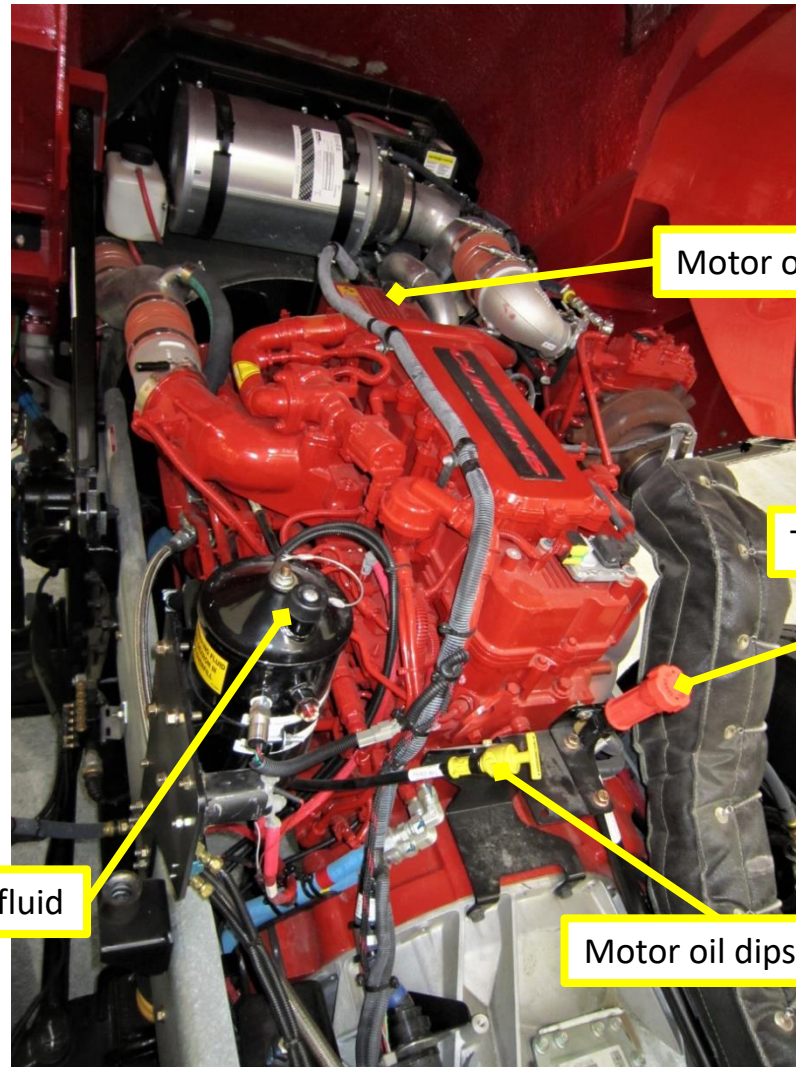
Motor Compartment



Motor Compartment



Motor Compartment



Motor oil fill

Transmission dipstick and fill

Power steering fluid

Motor oil dipstick

Data Plate



- Located at the driver's seat side of the motor housing
- Always verify fluid type before adding

Mo./Yr of Mfg		May - 2019	Job No.	32064-08	WO No.	23150459
GVWR		21,319 KG (47,000 LB)	Tire-Limited Max Speed	68 mph	Chassis	Enforcer
GAWR		TIRES		RIMS		COLD TIRE INFLATION
Front	9,072 KG (20,000 LB)	425/65R22.5 (L)		22.50x12.25		723 kPa (105 PSI) SINGLE
Rear	12,247 KG (27,000 LB)	12R22.5 (H)		22.50x8.25		827 kPa (120 PSI) DUAL
THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.						
VIN		4P1BAAFFXKA020400		TYPE Emergency Vehicle		
CUSTOM HIGH GRADE PAINT FINISH						
Red	Pierce No.	307	Sikkens Autocost BTLV Basecoat	FLNA38253		
None	Pierce No.	0	NA	NA		
FLUID CAPACITIES						
Verify All Fluid Capacities and Perform All Maintenance Items outlined in the Chassis Operation Manual At the Recommended Time Intervals						
Component	Fluid Capacity				Fluid Type	
Engine	24.6 Liter	26.0 Quart	16W40 CK-4			
Trans 4000 EVS	36.9 Liter	39.0 Quart	TES-296 Synthetic			
Coolant	31.2 Liter	33.0 Quart	OAT ELC			
Power Steering	3.8 Liter	4.0 Quart	TES 389 ATF			
Front Axle			75W90 SYN LUBE			
Rear Axle (#2 or Single)	21.8 Liter	23.0 Quart	75W90 SYN LUBE			
Rear Axle (#3)	0.0 Liter	0.0 Quart	75W90 SYN LUBE			
Cab Tilt	3.8 Liter	4.0 Quart	TES 389 ATF			
Gen None - KW	0.0 Liter	0.0 Quart	NA			
(Refer to Owners Manual for Temperature Ranges)						
Transfer Case	0.0 Liter	0.0 Quart	NA			
Equipment Rack - Per Reservoir	0.0 Liter	0.0 Quart	NA			
Breathing Air Compressor	0.0 Liter	0.0 Quart	NA			
CAFS Compressor	0.0 Liter	0.0 Quart	NA			
Water Pump Transmission	3.8 Liter	4.0 Quart	80W90			
Water Pump Primer	0.0 Liter	0.0 Quart	Not Required			
A/C Compressor	Refrigerant Charge	12.5 oz	Oil Type	PAO 48		
	4 lbs 5 oz					

After-Engine Exhaust Treatment





- Vehicle is equipped with diesel exhaust fluid and a diesel particulate filter

See [Cummins After-Engine Treatment Brochure](#) for more info.



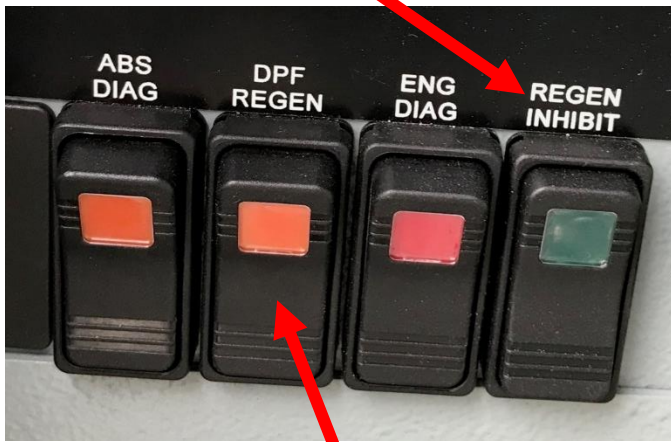
Regeneration Indicators



	<p>The Diesel Particulate Filter (DPF) light will illuminate when a regeneration is necessary. There are progressive stages of need for regeneration indicated by this light:</p>
	<p>1. On solid (low to medium levels of particulate build up). The vehicle requires regeneration but should be able to complete its mission before a regeneration is performed.</p> <ul style="list-style-type: none"> — Ensure the Regen Inhibit Switch is not activated. — Initiate a DPF regeneration by switching to a more challenging duty cycle (such as highway driving for at least 20 minutes or pumping) — OR perform a parked regeneration.
	<p>2. Flashing (medium to high levels of particulate build up). The vehicle requires a regeneration as soon as possible.</p> <ul style="list-style-type: none"> — Perform a regeneration by switching to a more challenging duty cycle or a parked regeneration.
	<p>3. Flashing with amber Check Engine light (high level of particulate build up). A DPF regeneration is required immediately.</p> <ul style="list-style-type: none"> — An automatic regeneration will not initiate. The operator must perform a parked regeneration.
	<p>4. If a parked regeneration is not performed the red Stop Engine lamp will illuminate.</p> <ul style="list-style-type: none"> — As soon as it is safe to do so, the vehicle should be stopped and remain shut down until serviced by an authorized dealer.

Active Regeneration

Prevents system from entering or continuing in active regeneration mode; used when regen may engage in an undesirable location










Used to manually initiate a parked regeneration; DPF lamp must be illuminated to engage

- Due to the type of travel typical of fire apparatus “active regeneration” is most common
- Active regeneration occurs:
 - a. When an intervention by the operator during travel or pumping operations creates correct conditions for regen
 - Requires sufficient exhaust flow and temperatures
 - Speedometer >5mph
 - NO engine speed variations will occur when pumping or driving
 - b. Manually by activating the DPF Regen switch while parked

Regeneration will not effect motor RPM during pumping operations if it engages automatically.

Parked Regeneration

						
DPF LAMP MUST BE ON OR FLASHING	STOP IN SAFE LOCATION	SET PARKING BRAKE	SET SAFE ZONE AROUND EXHAUST	FOOT OFF THROTTLE, BRAKE	HOLD REGEN SWITCH 5 SECONDS	MONITOR AREA STOP ENGINE FOR UNSAFE CONDITIONS!!
PRESSING BRAKE, THROTTLE, REGEN INHIBIT SWITCH WILL STOP REGENERATION PROCESS						
<ol style="list-style-type: none"> Stop vehicle completely, transmission in N (neutral), and set the parking brake. <ul style="list-style-type: none"> Park on a clean surface that will not melt or burn (clean concrete or gravel, not grass or asphalt). Engine control should be from accelerator pedal (not PTO, remote PTO, cruise, etc) PTO and running at normal idle (high idle should be OFF). Clear exhaust outlet area 5 ft of any items, gasses, vapors that can melt, burn or explode. If indoors, exhaust discharge pipe must be rated at least 1500°F (816°C). Keep foot off the throttle pedal and the brake pedal. 						
CAUTION						
<p>STAY with the vehicle. Monitor the area during the operation. if any unsafe conditions occur, shut off engine immediately!</p> <p>NOTE: Diesel Particulate Filter (DPF) lamp must be ON in order to start a stationary regeneration.</p> <ol style="list-style-type: none"> With the engine running, press and hold the vehicle's regeneration switch for several seconds. <ul style="list-style-type: none"> Engine speed increases. The turbocharger may make a different sound during the event. DEF lamp turns OFF. As hydrocarbons are added, temperature goes up. HEST lamp illuminates when exhaust temperature reaches 977°F (525°C). Regeneration may take 20-40 minutes or more, depending on soot level. Exhaust temps stay high at least 3-5 minutes after completion. To stop a regeneration before completion, depress throttle pedal, release parking brake, press the regeneration inhibit switch, or turn off the engine. When the regeneration is complete, the engine returns to normal idle speed and operation. <ul style="list-style-type: none"> If excessive soot remains in the filter, the DPF light(s) will return to the appropriate stage until another regeneration occurs. Repeat parked regeneration. If the DPF light still remains on, call for service. 						

Do not perform regen inside a building or while attached to an exhaust removal system!

A minimum of 5 feet of clearance is required to the exhaust outlet.

When pumping it may be necessary to inhibit regen if clearances to the exhaust are not available!

For additional information, refer to the [Pierce Saber/Enforcer Operator's Manual](#).

Fuel & DEF



- Diesel Fuel
 - Fills on both sides of the apparatus at the rear wheel well
 - 65 gallon capacity
- Diesel Exhaust Fluid (DEF)
 - Fluid level displayed on dashboard gauge panel and in Command Zone display
 - 4.5 gallon tank
 - Fill on driver's side co-located with diesel fuel fill
 - Light blue cap
 - Must open spring-loaded door to access

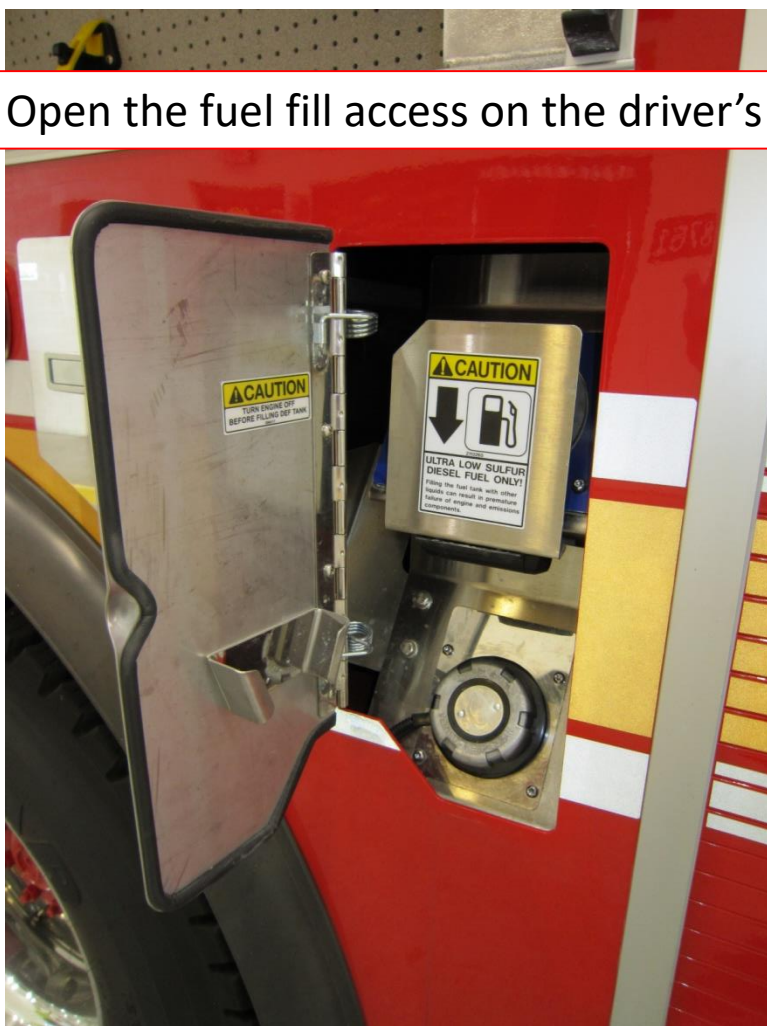


Officer side fill – diesel only

**The diesel fuel caps are silver and require opening one door.
The DEF cap is blue and requires opening two doors.**

DEF Access – 2 steps

1. Open the fuel fill access on the driver's side



Driver side fill – diesel and DEF

2. Pull down the spring-loaded cover to access the DEF tank cap



Exhaust System



- Exhaust outlet is 6" diameter
 - Crimson is 5"
- PlymoVent boots will accept up to 6 ¼" exhaust outlets
 - **The fit is tight!**
- Check your mirror to ensure the hose disengages from the exhaust when exiting the station
- Until the rubber molds to the larger tailpipe the boot may need to be manually disengaged

PLYMOVENT®

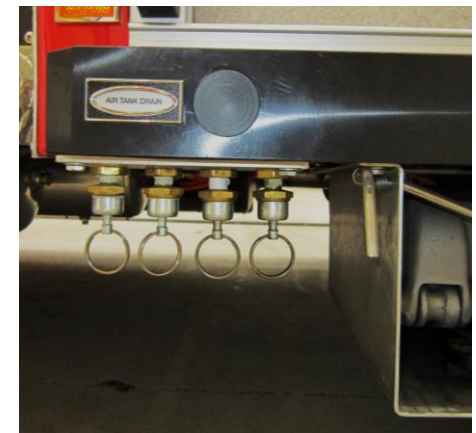


**Slow and steady
departures from the bay
are necessary.**

Suspension & Brake Systems

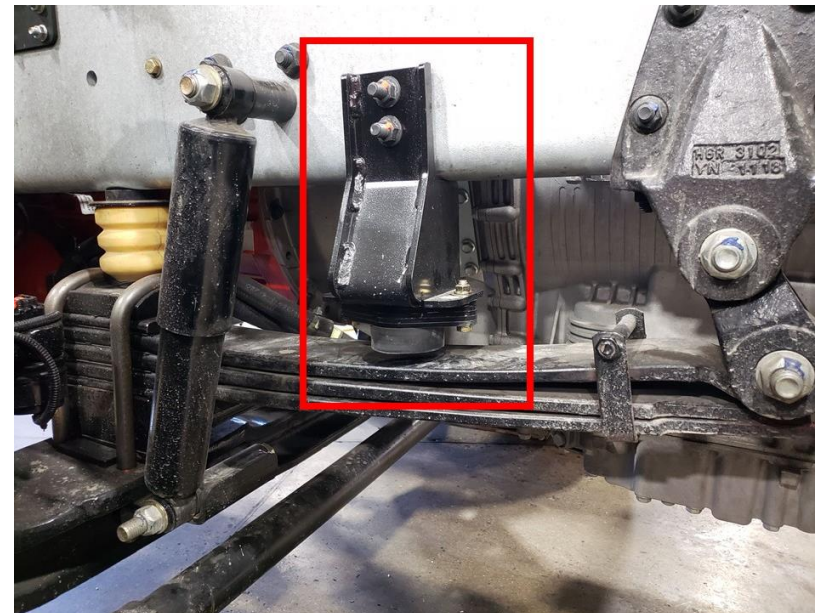
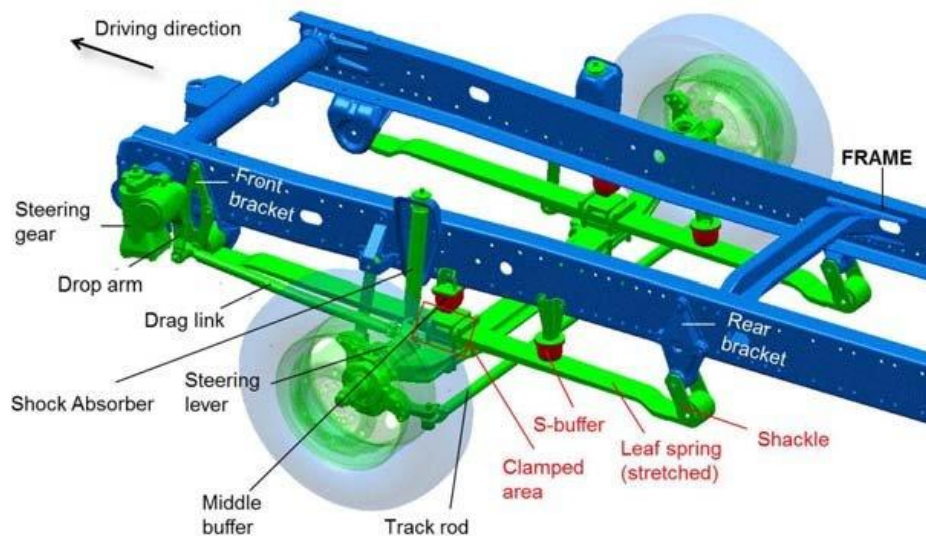


- 20,000lb front axle
 - Not TAK4
- 27,000lb rear axle
- Parking brake
 - Locks up all wheels
 - 2nd actuator located on officer's side dashboard adjacent to A-post for emergencies
- Anti-lock disc air brakes front and rear axle
- 18.7cfm air compressor
- 12v auxiliary air compressor behind driver seat
 - Powered by shoreline to maintain brake system while parked
- Heated air dryer on wet tank
- Stainless steel air storage tanks
- Air tank drain actuators – driver side beside wheel chock mount



Front Suspension

- When placed under the stress of emergency braking, front springs flatten and then assume a shape resembling an “S” as the front axle tries to rotate
- To reduce undesirable steering reaction during emergency braking, the front suspension includes “S-buffers” that stiffen the springs when the springs are compressed.

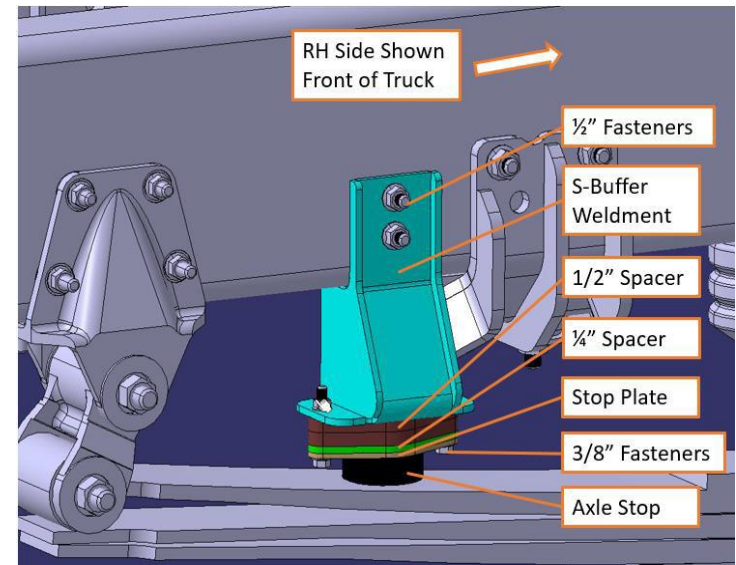


Front Suspension – S-buffer



Daily

1. Inspect for loose hardware of the S-Buffer Assembly.
 2. Inspect welds and surrounding metal of the S-Buffer Assembly for cracks.
 3. Look for signs of failure or tearing of the Rubber Axle Stop.
- ☒ If cracks are found in the metal of the S-Buffer, or if loose hardware is found, submit a defect report.
 - ☒ If the Rubber Axle Stop has surface cracks, submit a defect report.
 - ☒ If the Rubber Axle Stop is missing, failed, or torn, the truck should be placed out of service and the Rubber Axle Stop replaced. Physical inspection of spring for mechanical damage should take place.



Front Suspension – S-buffer



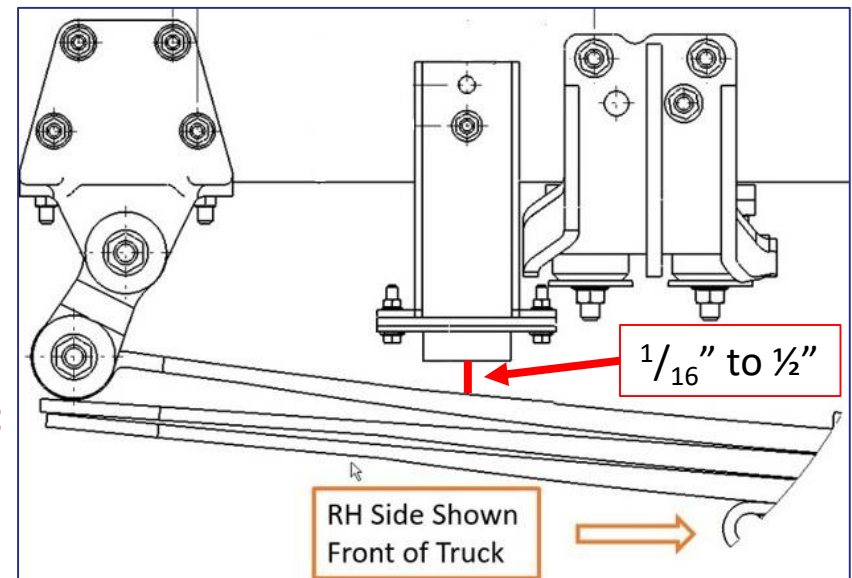
Monthly

1. Complete the daily inspection and;
2. Park loaded vehicle (with water, foam, equipment) on flat level ground with wheels pointed straight. Ensure parking brake is applied and wheels are chocked.
3. Inspect gap between Rubber Axle Stop and spring. Acceptable range is $1/16''$ to $1/2''$.

If the gap is outside of accepted range: drive cautiously around parking lot, re-position on flat level ground with wheels straight and re-measure the gap.

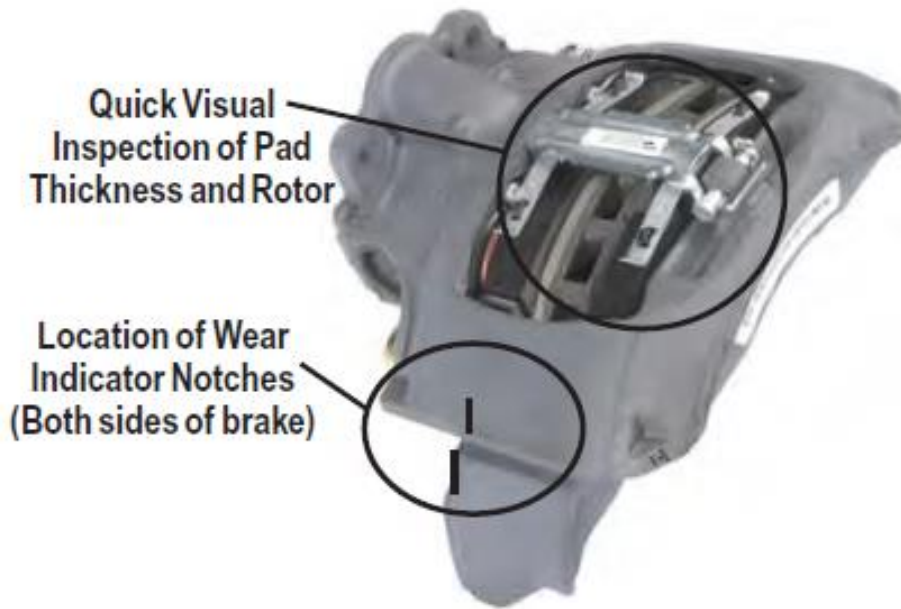
> $1/2''$: place the vehicle out of service and contact CMF.

< $1/16''$ or the Rubber Axle Stop is touching: submit a defect report. NOTE: This is not an immediate out of service condition.



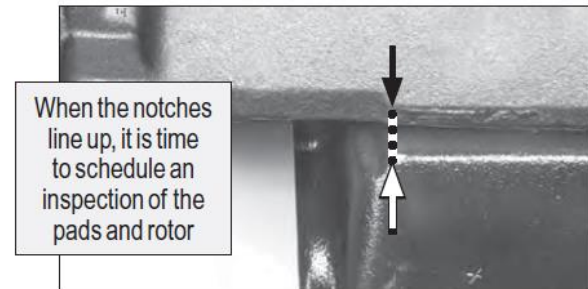
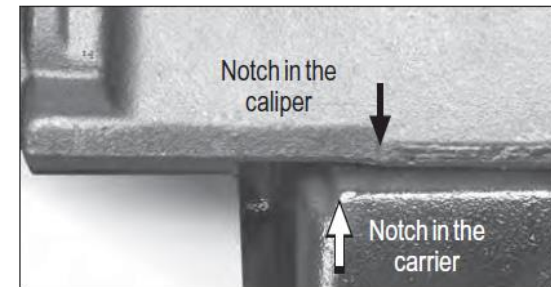
Brakes – Front Axle

Bendix ADB22X Disc



Where both the carrier and caliper have an indicator notch.

Compare the relative position of two notches cast into the carrier and caliper. When the two notches align, it is time to schedule a full wheel-removed inspection of the pads and rotor.



Pads must be replaced at 11mm (approximately 7/16")

For additional information go to the [Bendix Service Bulletin](#)

Brakes – Rear Axle



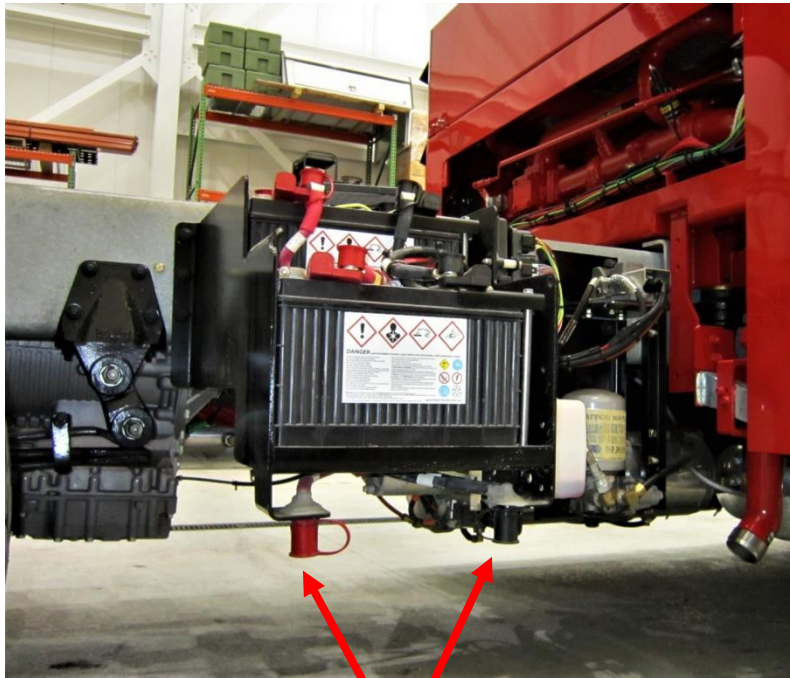
Meritor DiscPlus EX225 Disc



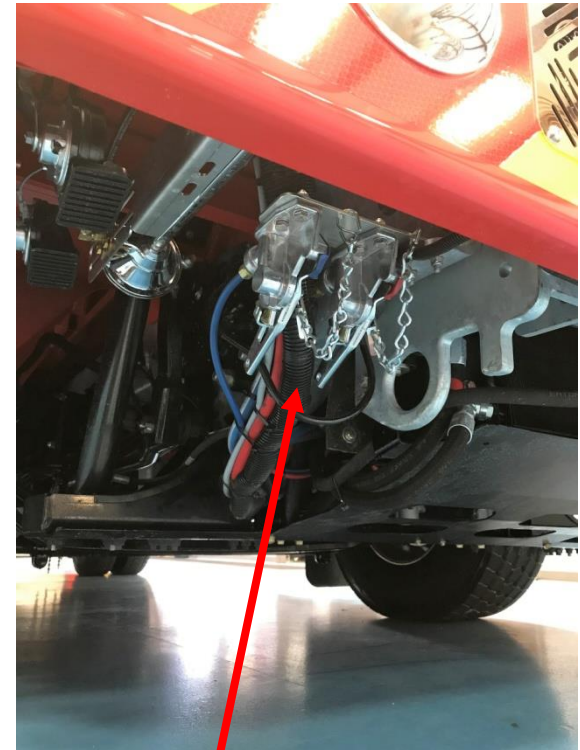
Pads must be replaced at 3mm (approximately 1/8")

For additional information go to the [Meritor Maintenance Manual](#)

Jumper Studs & Glad Hands



Jumper studs accessible below driver's side cab door when cab is nested



Glad hands located below the front bumper to assist with towing

Snow Chains



- OnSpot automatic snow chains on rear axle
- Switch located on dashboard to the left of the steering wheel
- The On-spot chains have a 5 second delay before they activate. This is done to prevent accidental activation.



ONSPOT



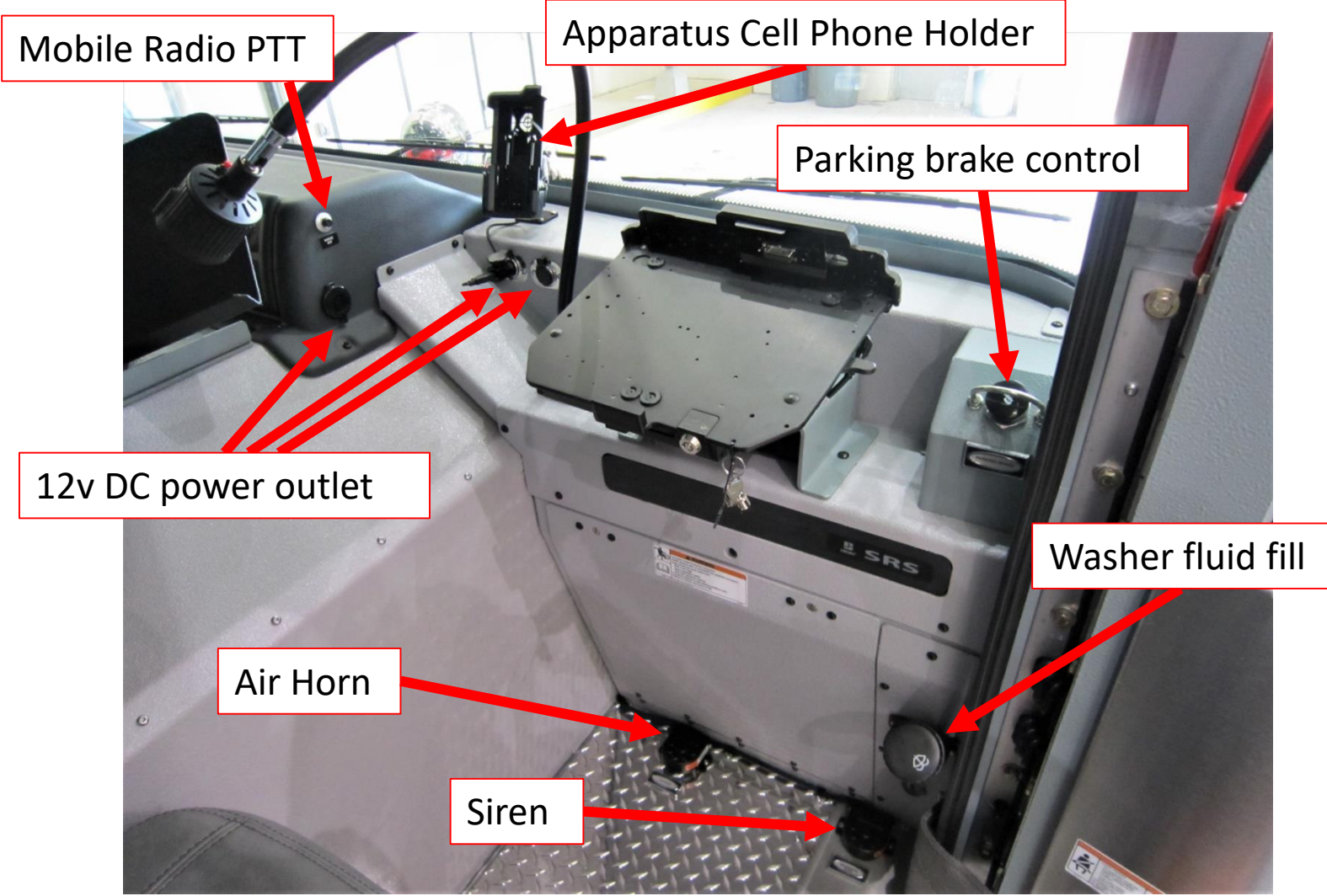
Shoreline



- 20 amp, 120v NEMA 5-20 plug with green indicator light
- Driver's door must remain open when shoreline is connected
- Supplies IOTA DSL55 55 amp battery conditioner and auxiliary air compressor

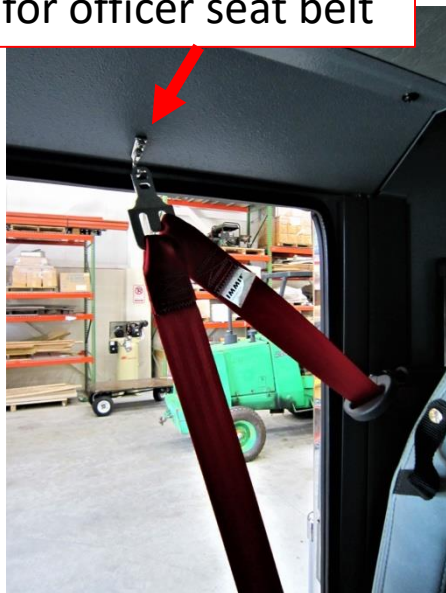
**This is not an auto-eject plug.
Must be unplugged manually before
closing the cab door.**

Officer Seat Area



Officer Seat Area

Convenience hook for officer seat belt



Scene lights

Rear siren speaker on/off

Apparatus speed



Electronic siren has a rear facing speaker. Officer controls the on/off. Intent is for notification during merging situations on limited access roadways.



Dashboard Display



Driver's Seat



Forward/aft adjustment

Air controlled height adjustment



Warning Light Controls

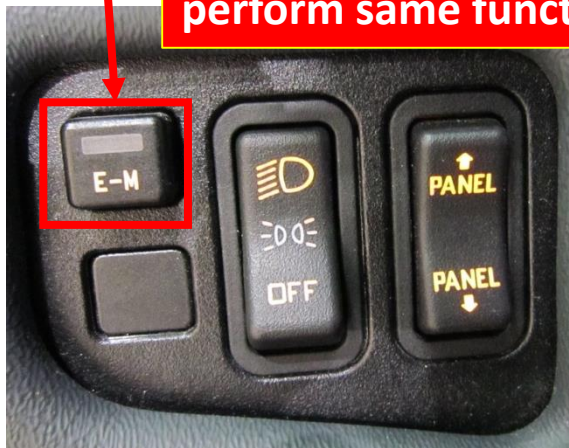


Warning light switch panel



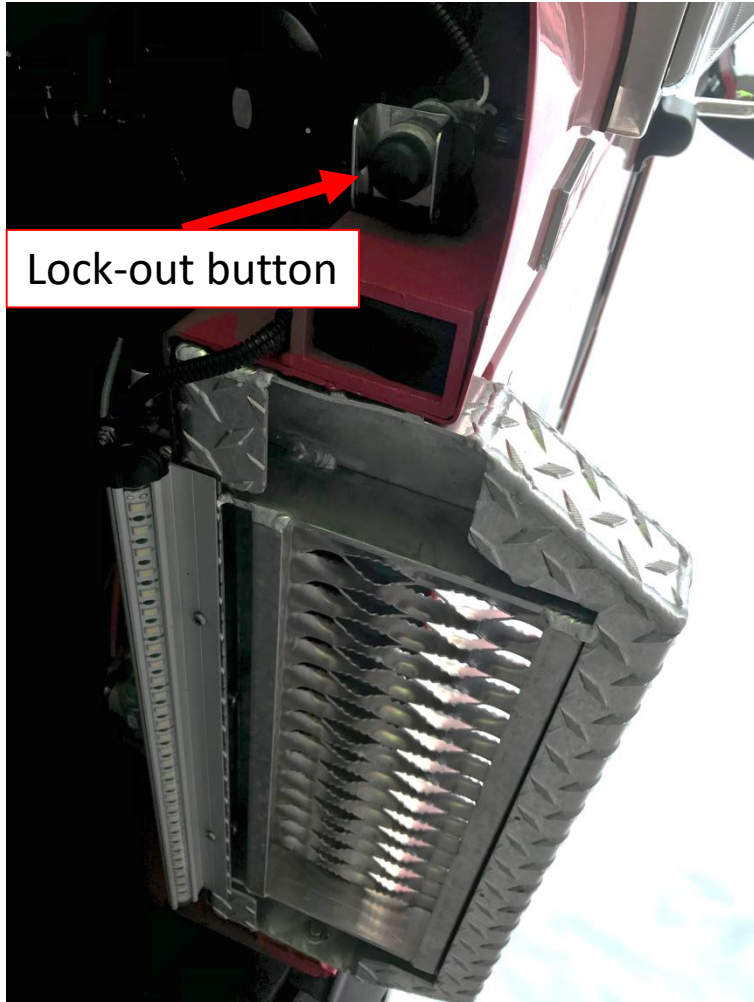
Scene light switch panel

E-master switch on the overhead panel and on the dashboard perform same function

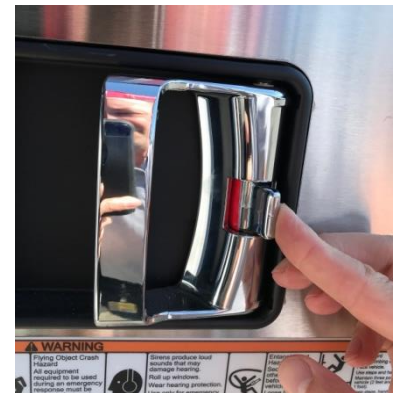


Allows operator to control clear warning lights manually. Resets to default setting when E-master is cycled.
Useful when clear lights are blinding during fog or snow.

Cab Door Locks



- Electric door locks on cab entry doors
 - Not connected to compartments
- Lock-out switch located below the cab by the driver's door entry step
- **Driver and officer doors control all four cab doors**
- E3 and E4 doors only control the individual doors



Starting & Stopping the Motor

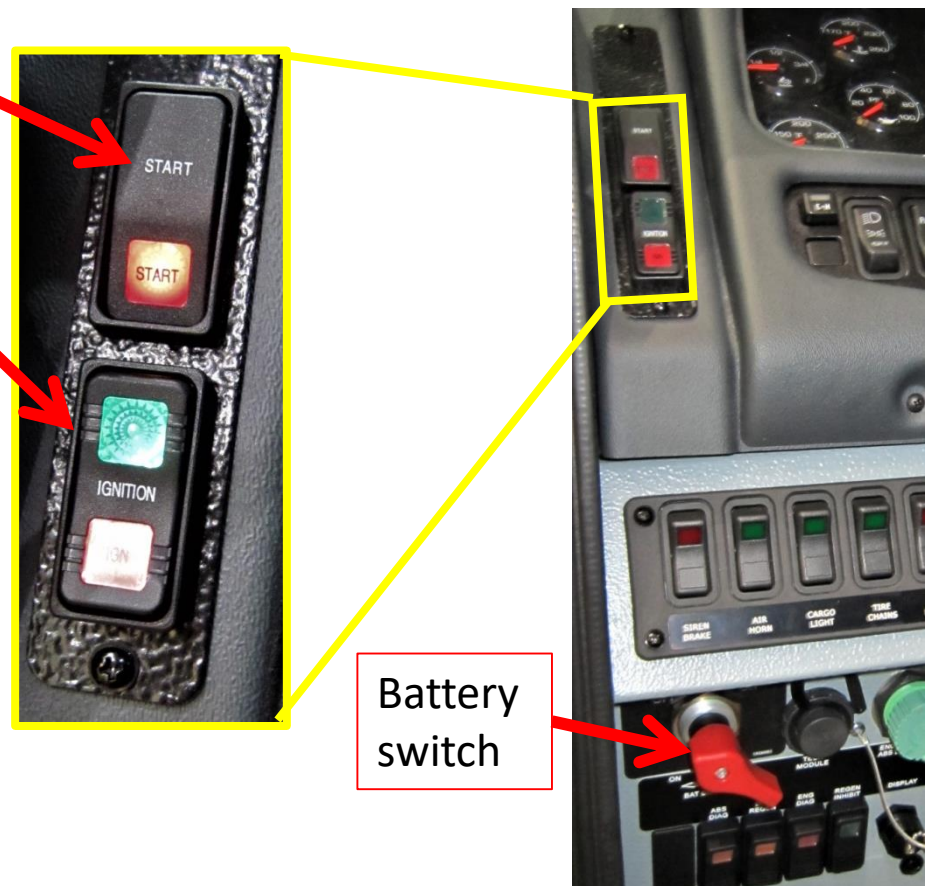
- Battery switch, ignition switch, and start button are all grouped near the A-post on the driver's side

Press to start the motor.
Engage for no more than 15 seconds.

Ignition switch
-up to run/on
-down to shut off

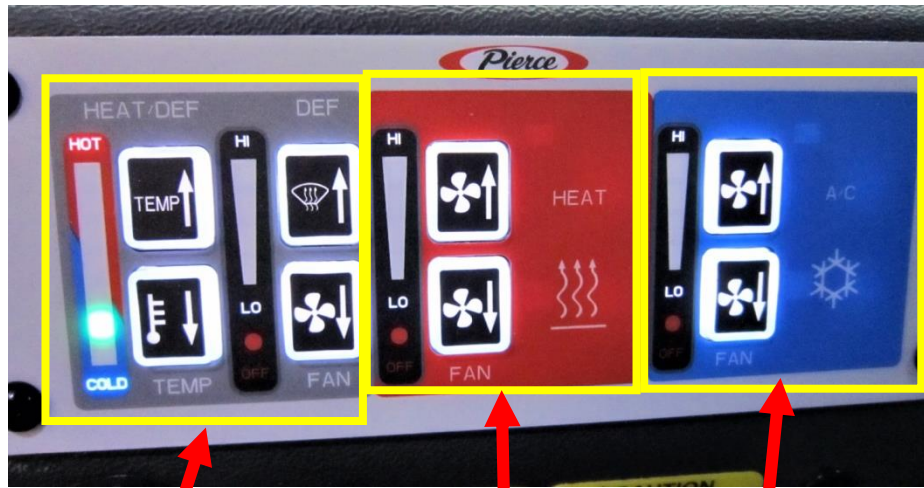
Allow gauges to complete their sweep before attempting to start the motor. Failure to wait can result in false sensor alarms.

In addition to the battery, ignition switch must be "on" for most electrical functions to work (like cab tilt)



Battery switch

HVAC, High Idle, Pump Shift

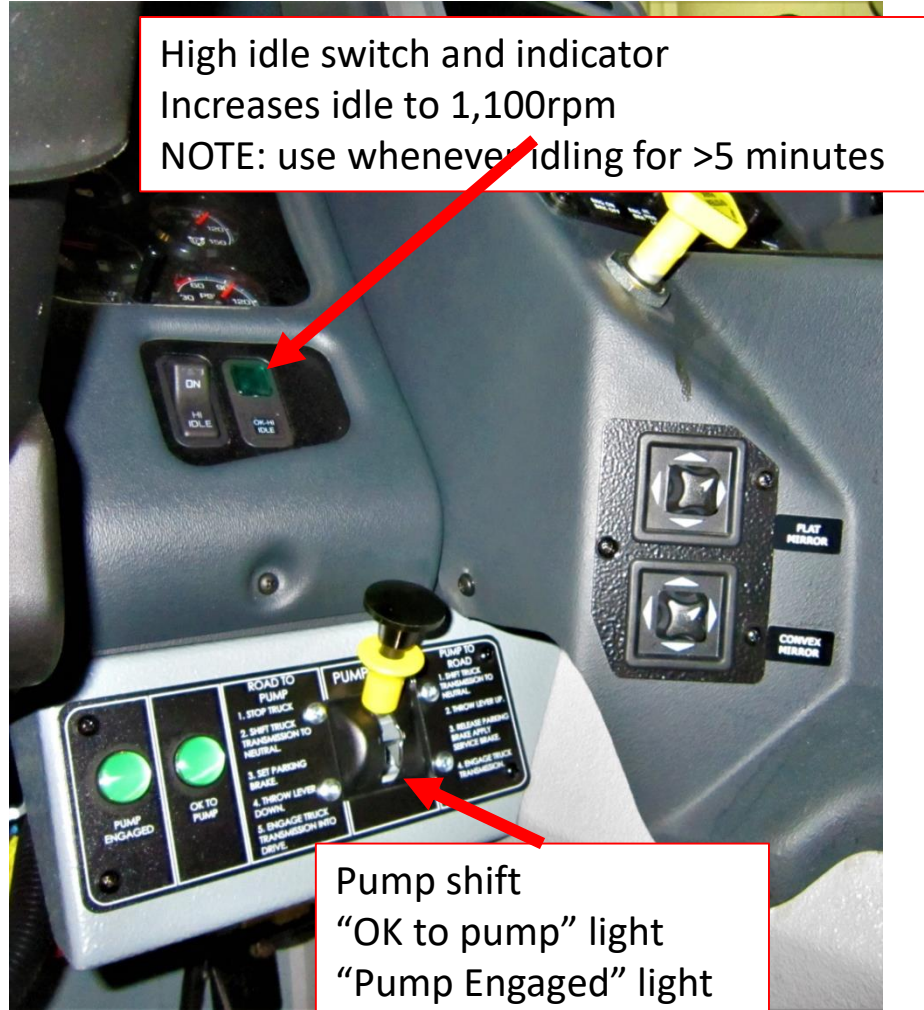


Defroster

Heat

Air
Conditioner

Defroster requires air from the intakes on the face of the dashboard; keep it clear of obstructions.



High idle switch and indicator
Increases idle to 1,100rpm
NOTE: use whenever idling for >5 minutes

Pump shift
"OK to pump" light
"Pump Engaged" light

Jake Brake, ATC, Mirror Heat

- Engine (Jake) Brake
- Auto Lube Fault Indicator
- Off-Road Traction
- Low Power Steering Fluid Indicator
- Mirror Heat



Momentarily impairs ATC to allow more wheel spin; may be desirable in extra soft surfaces like snow, gravel, or mud (similar to Mud/Snow on Crimsons)

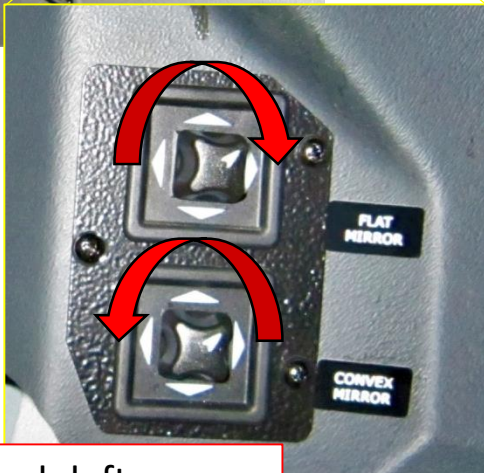
Pierce recommendation: When road conditions dictate that a driver change his/her driving pattern, the driver should disable auxiliary braking systems (Engine Brake).



Mirror and Wiper Controls



Flat and convex mirror adjustment controls



Turn the knob left or right to select the mirror



Windshield wiper control

Wipers are programmed to stop operating when parking brake is engaged; saves the wiper blades

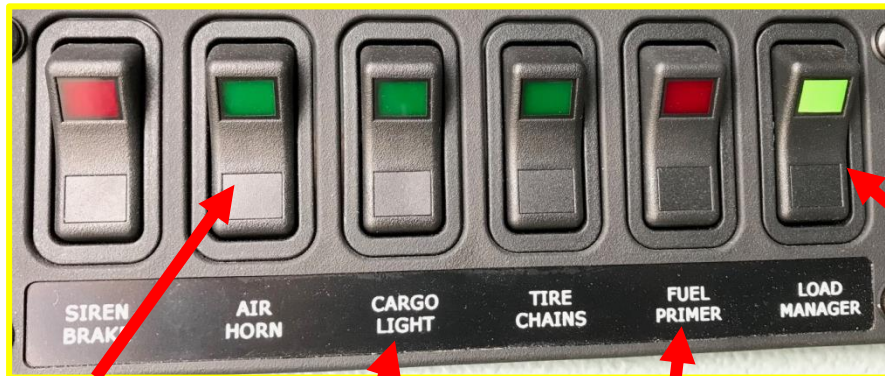
Siren Brake, Headlights, E-Master

Emergency Master



Headlights/DOT Lights

Panel light dimmer



Electric/Air Horn in steering wheel hub

Controls work light above crosslays

Used to prime system if fuel runs out or following maintenance; not used under normal conditions

Shows when load sequencer is engaged; no operator intervention should be needed



Command Zone Display



- Command Zone III system located on the dashboard to the right of the steering wheel
- Functions are a mix of hard buttons and touch screen
 - ✓ Vehicle systems monitoring
 - ✓ Vehicle systems controls
 - ✓ Vehicle diagnostics

Home Screen

Fuel, DEF, Speed, Seat Belt Status



Go to the Driver Training website for additional [Command Zone III](#) information.

Command Zone – Fire Function



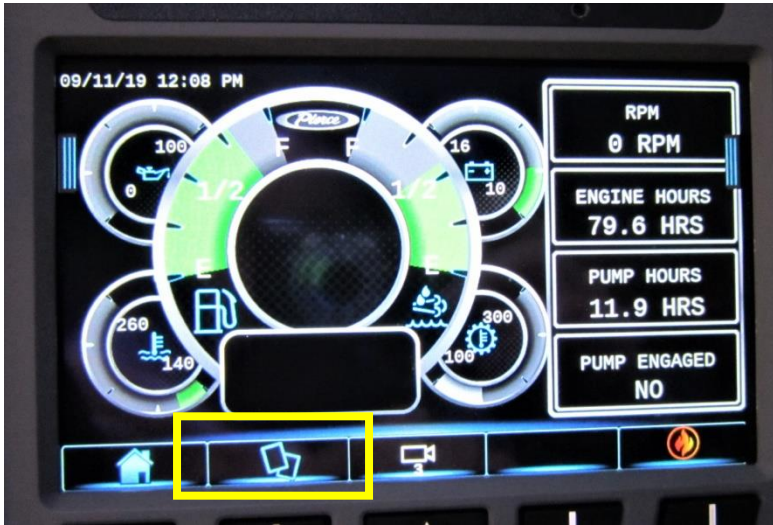
Fire Functions & Vehicle Status

Fuel, DEF, Oil, Voltage, Water Temp,
Transmission Temp
Engine RPM
Engine Hours
Pump Hours
Pump Status

Default screen when
pump shift occurs



Command Zone - Menu



Menu Screen
Use arrow keys to select function status to be displayed.

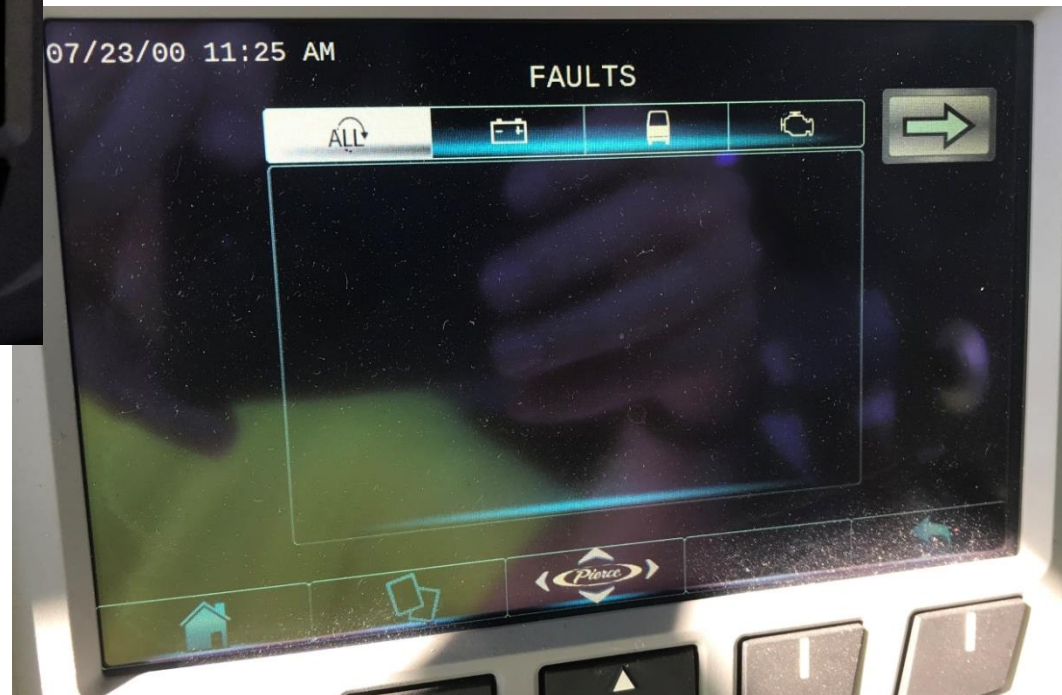
Command Zone - Notifications



Notifications

Accessible from Menu screen

Serious faults or messages will also appear as general notifications on the Home screen

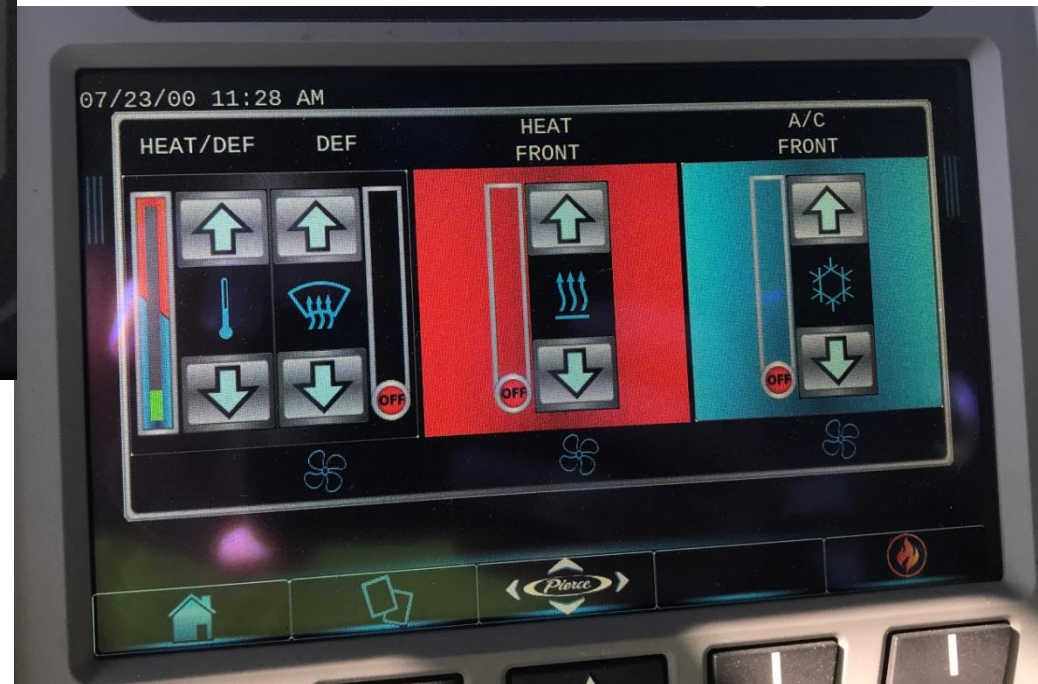


Command Zone - HVAC



HVAC

Accessible from Menu screen
Same controls as the dashboard

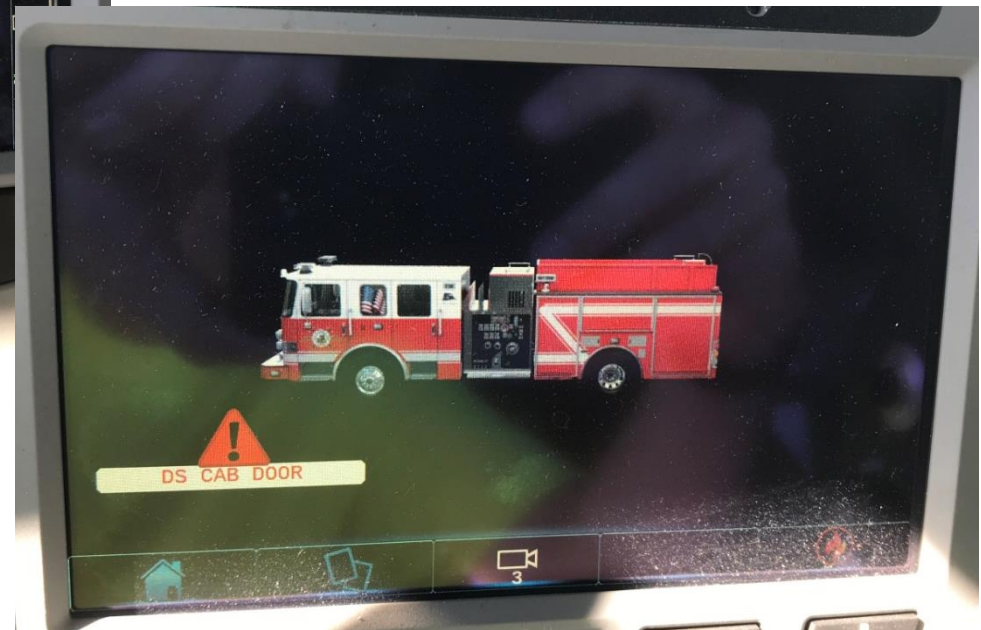


Command Zone – Do Not Move



Do Not Move Truck

Accessible from Menu screen.
Enables specific identification of open doors or other warnings.



Command Zone - Timer



Timer

Accessible from Menu screen

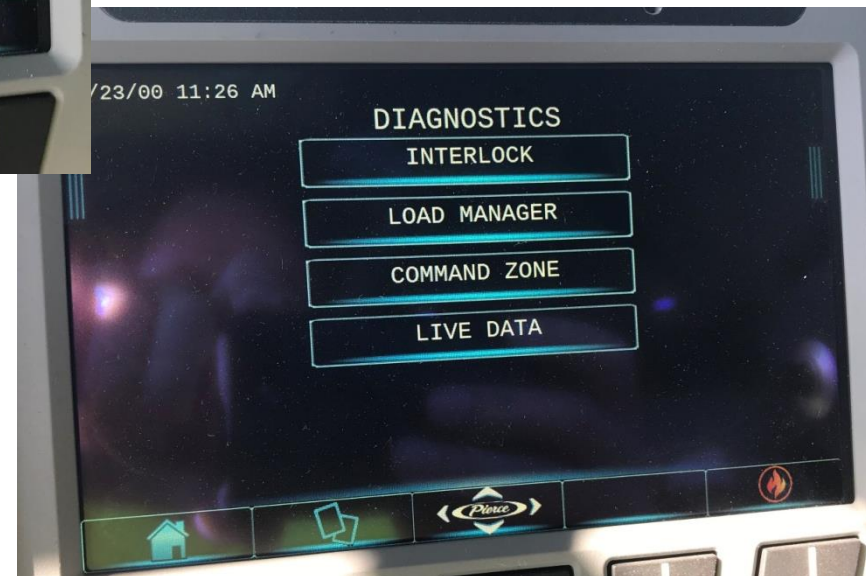


Command Zone - Diagnostics



Diagnostics

Accessible from Menu screen
Shows the status of various systems on the vehicle.



Command Zone - Camera



Rear Camera Screen

Press down arrow to display when transmission is not in Reverse.
Press up arrow to turn off.

Defaults to this screen automatically when transmission is in Reverse

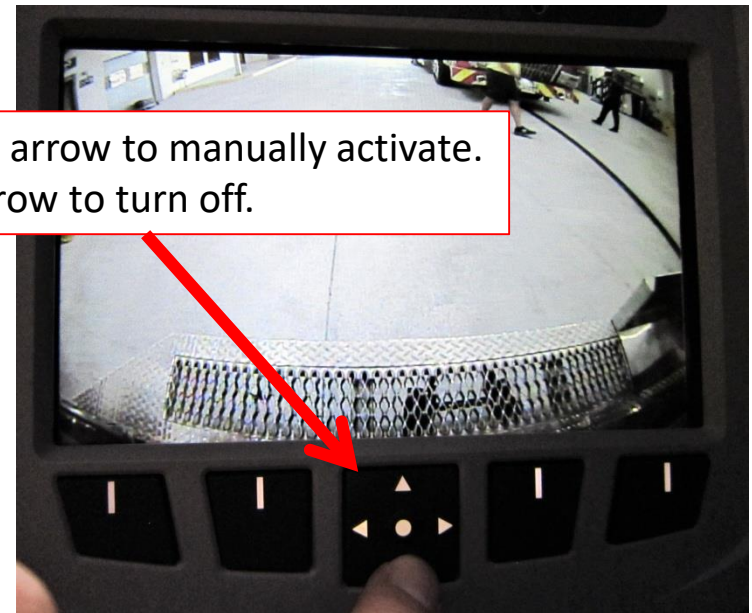
Rear Camera

- Located above the rear compartment; displayed in command zone screen on dashboard
- Automatically engages with transmission in “reverse”
- Manually engages using buttons at the display screen



Note: net blocks the camera when rear hosebed is deployed

Press down arrow to manually activate.
Press up arrow to turn off.



SCBA Brackets – SmartDock



- No straps or levers to restrain the SCBA or to release the SCBA - blue latching mechanism holds the SCBA in place during transit.
- In the event of a collision, inertial forces cause the top latching mechanism to lock the SCBA in place, preventing it from becoming a projectile.
- **To release the SCBA, a smooth motion is required. Slow is smooth; smooth is fast.**
- With the SCBA straps donned, the wear should bend forward at the waist and stand up to release the tank from the upper claw.
- If the tank is too loose or too tight within the claw there is an adjustment knob on top of the bracket.



For additional information view a quick video at

<https://www.youtube.com/watch?v=y43vJK3bsVo&app=desktop> or check out the manufacturer's website at <https://www.imminet.com/products/fire-ems/smartdock/>

SCBA Strap Retainers



- Each SCBA-equipped seat has loops to stow SCBA straps
 - Enhances donning while seated
 - Secured by magnets (look like buttons)



Suppression Features



- Hale 1500gpm single stage Qmax pump
 - For operations, features, and maintenance details go to [Hale QMAX Pump Manual](#)
- Hale Total Pressure Master (TPM) system
- Trident air primer
- Class 1 SmartFOAM proportioner with FoamLogix 6.5 pump
- 750 gallon water tank
- 50 gallon class A foam tank

No CAFS

No integral Class B foam tank

No Autofill

Pump Shift & Engagement



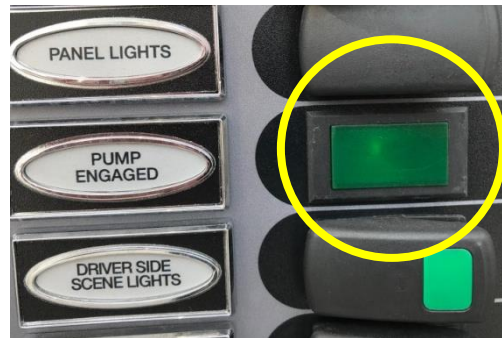
In-cab signs of successful pump shift

- ✓ Indicator lights beside shift lever
- ✓ Command Zone screen
- ✓ Speedometer rises
 - Note: accelerator pedal remains active even in pump gear



Pump panel signs of successful pump shift

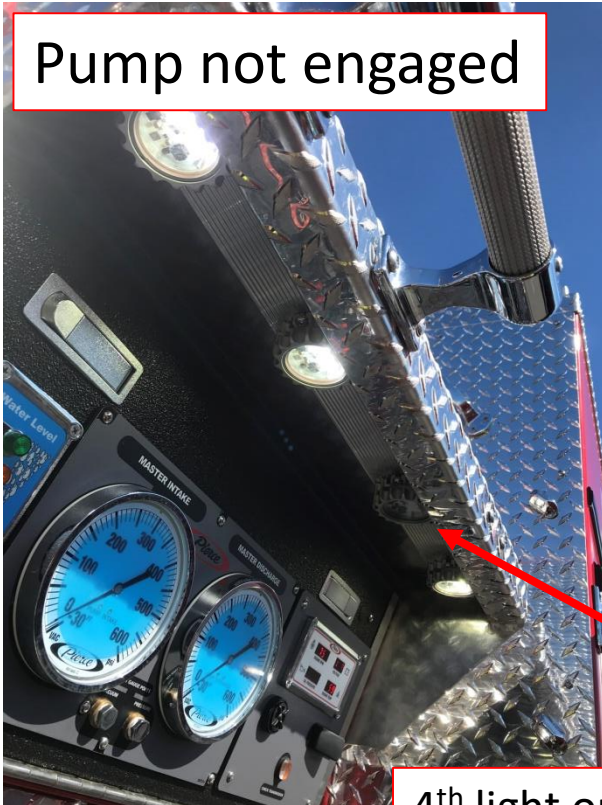
- ✓ Pump Engaged light illuminated
- ✓ 3rd panel light illuminated (see next page)
- ✓ Pressure rise on main discharge gauge (assuming a wet pump)
- ✓ Auto light lit on pump primer (assuming AUTO mode)



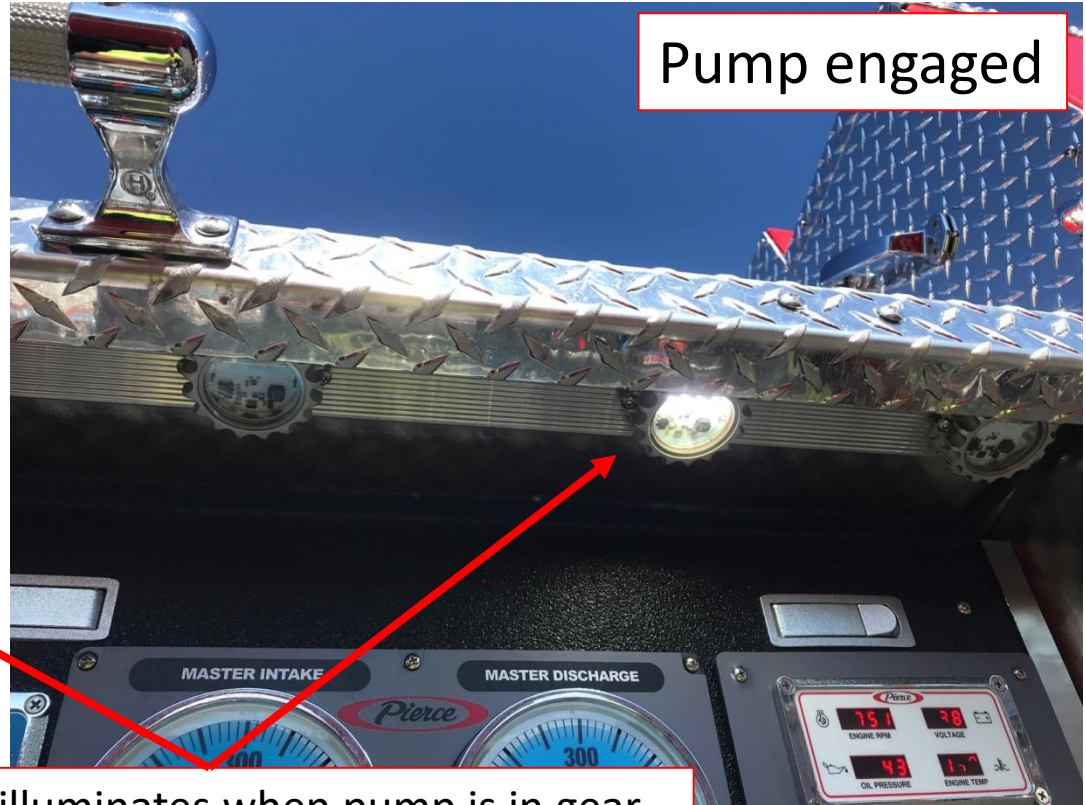
There is no manual override for the pump shift.

Pump Panel – Driver Side

Pump not engaged



Pump engaged



4th light only illuminates when pump is in gear

Pump Panel – Driver Side



- Rear Discharges
- Deck gun
- Foam controller
- Throttle
- TRV



Pump Panel – Driver Side



- Motor diagnostics
- Alarm silence



Pump Panel – Driver Side



- Crosslays
- Drivers Side Discharge 1
- Booster Reel



Pump Panel – Driver Side



- Intake controls
- Intake primers
- Intake bleeders



Pump Panel – Driver Side



- Discharge drains
 - Note: no drain for the deck gun; drains by gravity back into the main pump
- Air outlet and valve
- Intake relief valve drain
- Foam manifold drain



Pump Panel – Driver Side



- Large Diameter Discharge Controls

Unlike the Crimson, there is no integral pressure relief valve on these discharges.



Pump Panel – Driver Side



- Switch panel
 - Booster reel rewind
 - Panel lights
 - Pump Engaged indicator
 - Scene lights



Pump Panel – Driver Side



- Driver side intake
- MIV override



Pump Panel – Driver Side



- Hale Total Pressure Master
- Throttle control
- Hale Thermal Relief Valve

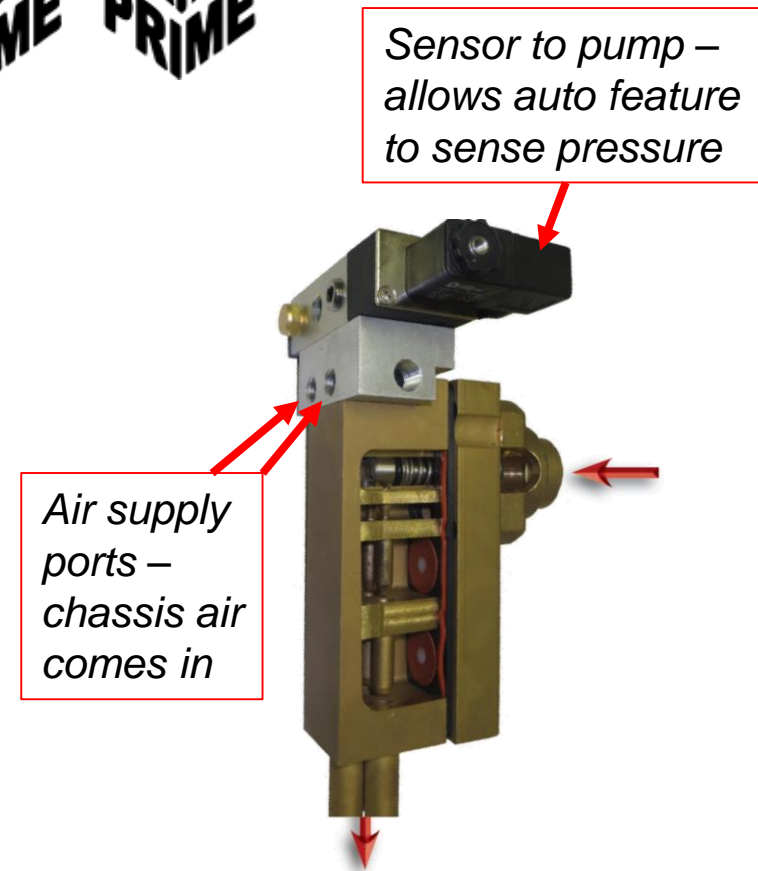


Pump Primer



Trident Air Primer

- Utilizes air supplied by the chassis air brake system to operate the pump primer
 - Up to 15.6 cubic feet per minute
- Very low impact on vehicle electrical system - 0.4 amps
- 27' vertical lift capable
- Two types of controls
 - Manual
 - Automatic



Pump Primer



- No internal motor, solenoid, or cables
- Brass and steel construction
- Primer design provides automatic draining to avoid freezing
- No lubrication necessary
- No limitation on primer engagement time
 - Only limitation is avoiding running a dry pump in gear



Primer located behind curbside pump panel

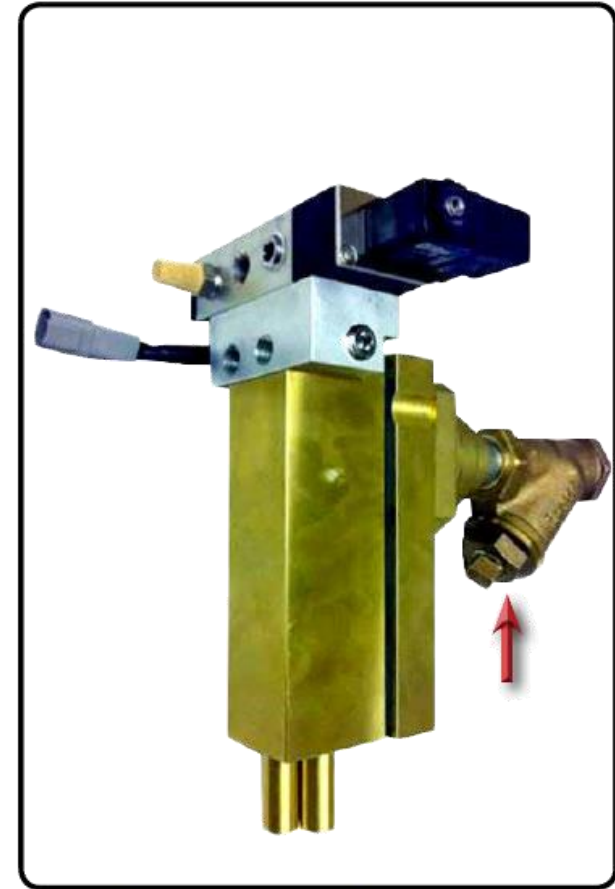
Pump Primer



- No maintenance requirements for operations personnel
- If priming becomes noticeably slow or weak, personnel may check the integral strainer for debris



Separate and Cleanable
Wye Strainer

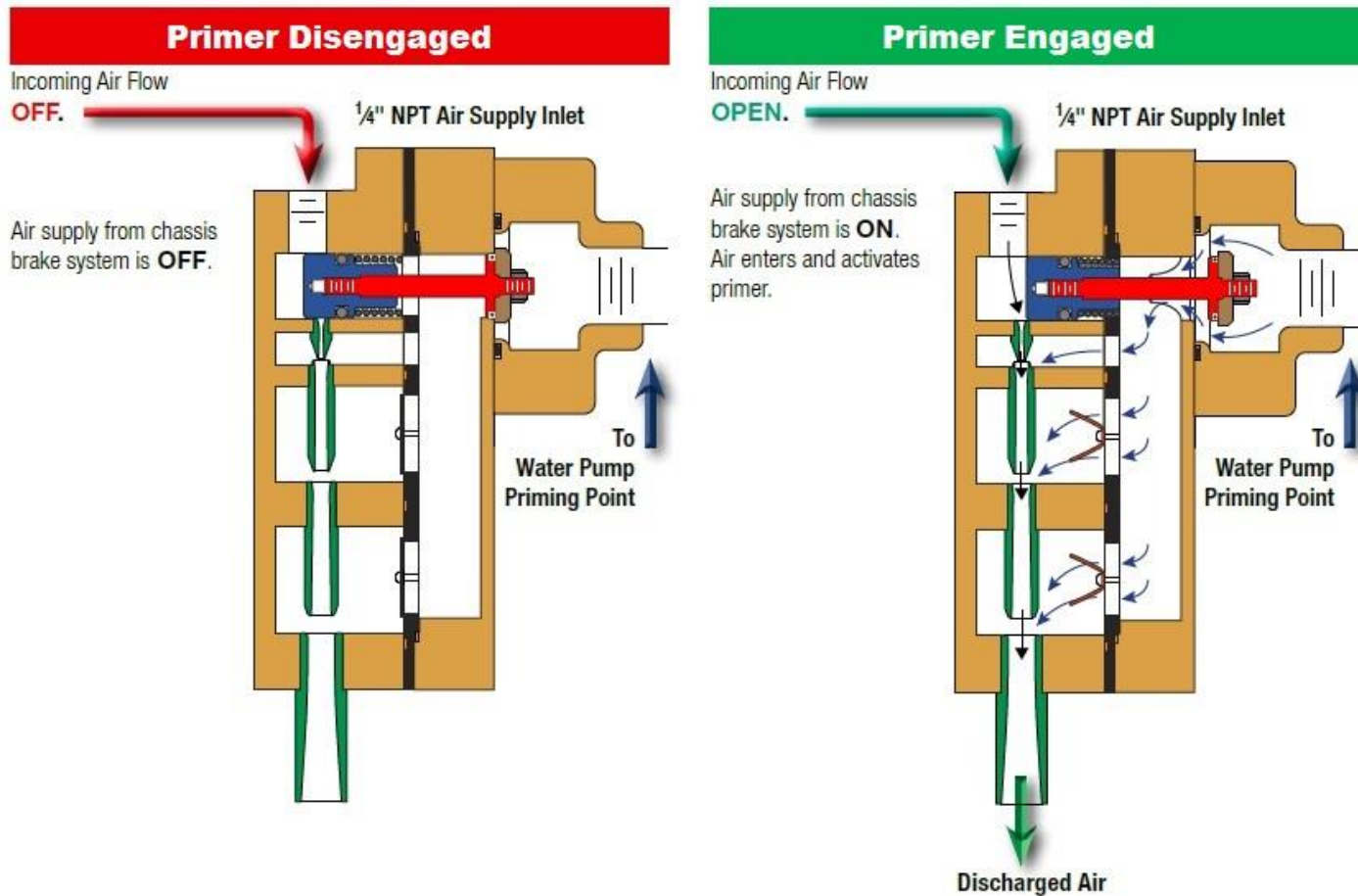


Integral Strainer on Primer Intake
Shown With Red Arrow Above

Pump Primer

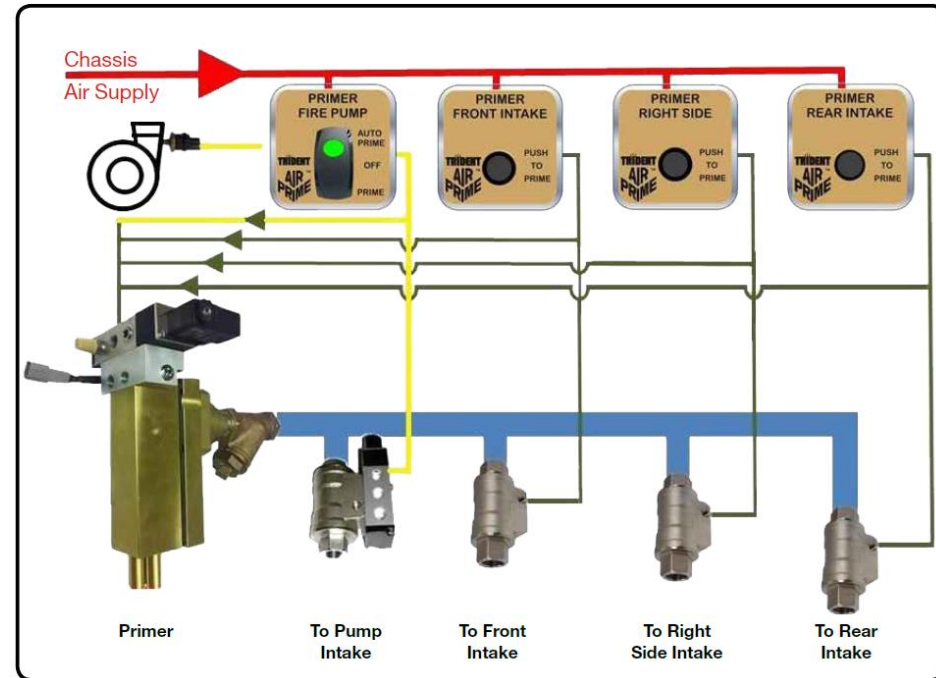


Internal Operating Mechanism



Pump Primer – Main Pump

- Auto Primer engages when pump pressure measured near the impeller drops below 20psi
 - Air slug
 - Discharge opens too fast
 - Switching from tank water to another source
- Manual intake primers can be simultaneously engaged with the Auto Primer



Combination Auto/Manual system

- ✓ *Auto for the main pump*
- ✓ *Manual for the individual intakes*

Pump Primer – Main Pump



- Primer for the main pump is automatically activated when:
 - ✓ Pump is in gear – “OK to PUMP”
 - ✓ Pump pressure is <20psi; and
 - ✓ Auto Prime is engaged (light is lit)
- Auto Primer can also be disengaged and used manually
 - Depress the control switch downward toward the “PRIME” label
 - Useful for periodic testing of the primer
 - Not normally the desirable mode of operation
- Generally leave the switch set to AUTO



Pump Primer - Intakes



- Operator manually depresses the PUSH TO PRIME button for the desired intake
- Configured to prime the individual intakes
 - Augments main pump primer
 - Located outboard of the MIV
 - Replaces the selector valve on the Crimson engines
- Used in a combination Automatic system to prime driver, officer, or rear intakes individually
 - Plumbed to the outboard side of the intake – allows priming the hardsleeve prior to opening the intake
 - Will function concurrently with and independently of the Auto function so priming can occur on both the main pump and intake simultaneously



Pump Primer - Intakes



Rear soft sleeve pulled into the plumbing by the primer!



- Rear and officer side intakes have preconnected soft sleeve hose
- When testing the manual primer, ensure:
 - Bleeder valve is open and/or
 - Disconnect the hose

DO NOT engage the manual primer with a soft sleeve attached and the bleeder closed. Damage to the hose will occur!

Pump Primer



Additional information resources:

- Troubleshooting Guide
 - <http://www.tridentautoairprime.com/troubleshooting.html>
- Internal Operation Animation
 - <http://www.tridentautoairprime.com/animation.html>
- Trident Website
 - <http://www.tridentautoairprime.com/>

Class A Foam System



- Integral 50 gallon Class A foam concentrate tank
- Class 1 SmartFOAM proportioning system with FoamLogix 6.5 pump
 - Four preset Class A foam injection modes
 - Defaults to “off”
 - Injection begins when the pump operator selects the desired preset mode.
 - Pump discharge pressure must be **below 200psi** with a flow of **at least 20gpm**.
 - NOTE: all units will be retrofitted with a FoamLogix 5.0 pump in early 2020



Foam solution discharges

- ✓ Both crosslays
- ✓ All four rear discharges

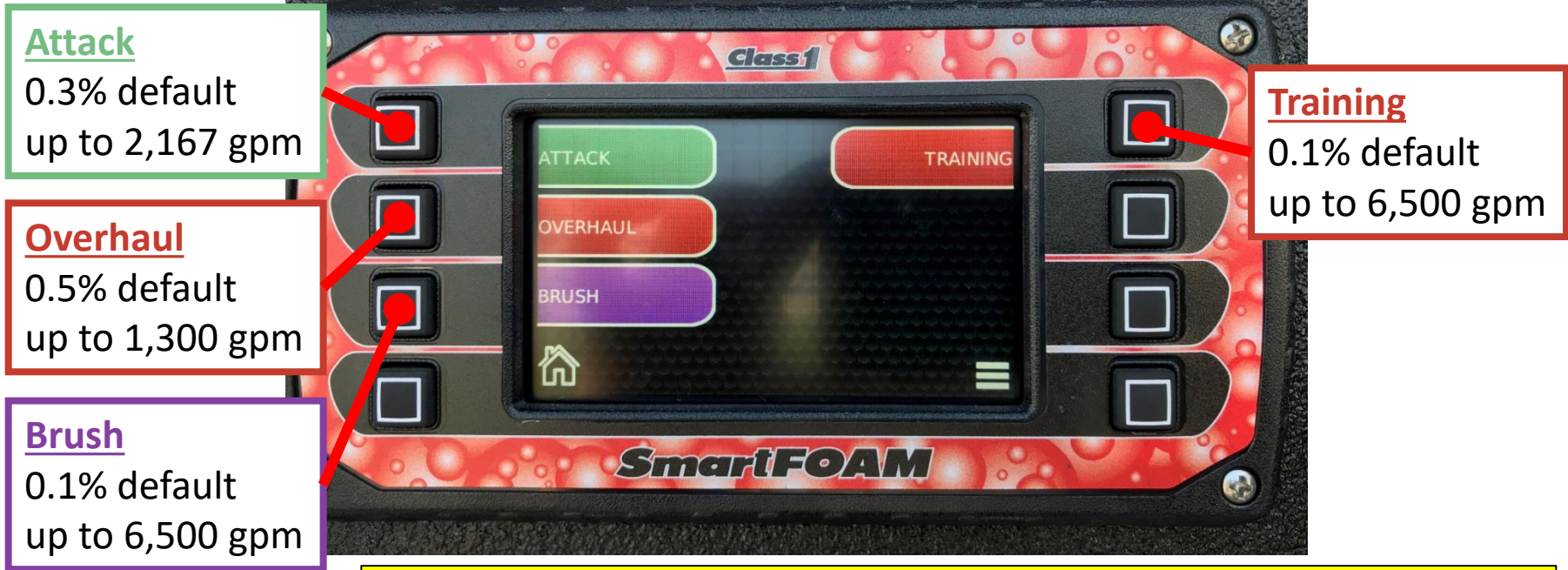
For more information go to:

<https://www.montgomerycountymd.gov/mcfrs-psta/driver/DriverTrainingPierceEnforcer.html>

Class A Foam – Home Screen

Default view when pump is first engaged and returns upon pushing the “home” button on the controller. System defaults to the foam being “off” and pump is in “plain water” mode.

Operator initiates desired foam operations by selecting the corresponding mode: ATTACK, OVERHAUL, BRUSH, TRAINING.



The flow rates shown are based upon a FoamLogix 6.5 pump.

Class A Foam – Home Screen

The flow rates shown are based upon a FoamLogix 5.0 pump.

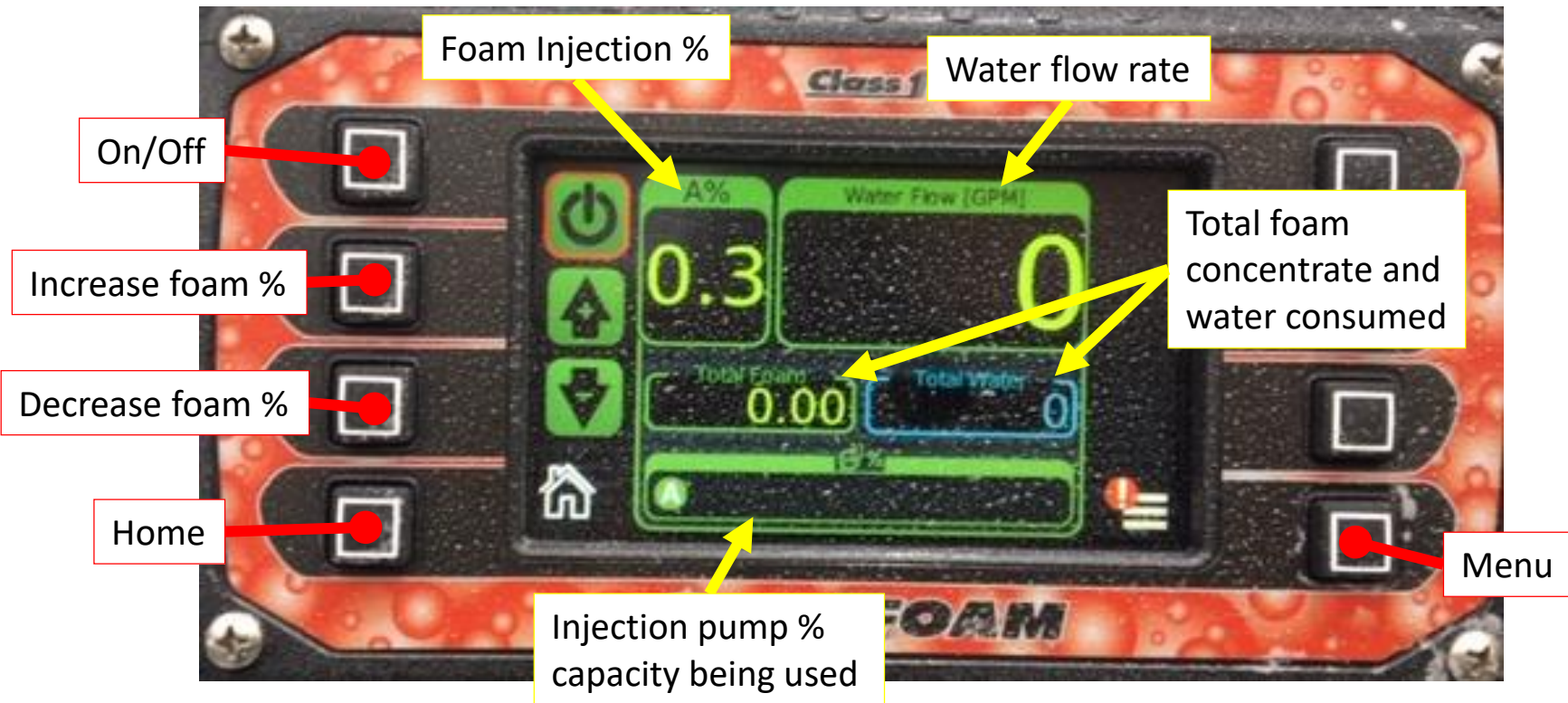


The image shows a control panel for a Class 1 foam pump. The panel features a central touchscreen with four main menu options: ATTACK (green), OVERHAUL (orange), BRUSH (purple), and a home icon (white). To the right of the touchscreen is a red button labeled TRAINING. The panel is surrounded by several physical buttons, some of which are highlighted with red callout boxes. The background of the panel has a red and white bubble pattern. The text 'Class 1' is visible at the top and 'SmartFOAM' at the bottom of the panel.

Mode	Default Flow Rate	Maximum Flow Rate
Attack	0.3%	up to 1,667 gpm
Overhaul	0.5%	up to 1,000 gpm
Brush	0.1%	up to 5,000 gpm
Training	0.1%	up to 5,000 gpm

Class A Foam – Operation Screen

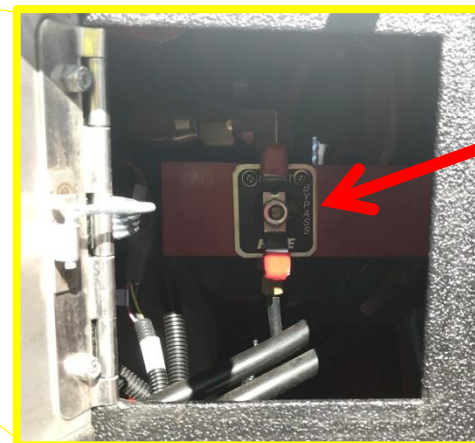
Default screen after an operation mode is selected from the home screen. Enables control and monitoring of foam solution operation. Once underway, a foam operation must be shut down from this screen.



System will automatically shut off the foam pump if the foam tank is empty.

Class A Foam – Pump Bypass

- A bypass valve is located behind the access door on the driver's side pump panel
- Normally kept in the “inject” position
 - Directs foam concentrate into the pump
- “Bypass” is used to prime the foam pump, during foam pump calibration, or when emptying the foam tank
 - Directs foam concentrate to the ground

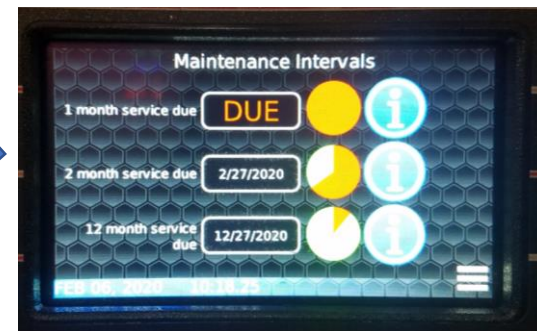
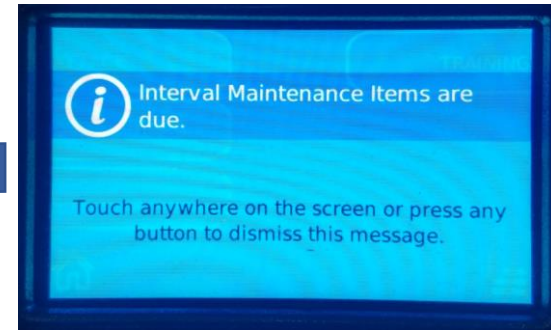


Bypass Valve in the normal operating position – “Inject”

Class A Foam - Maintenance



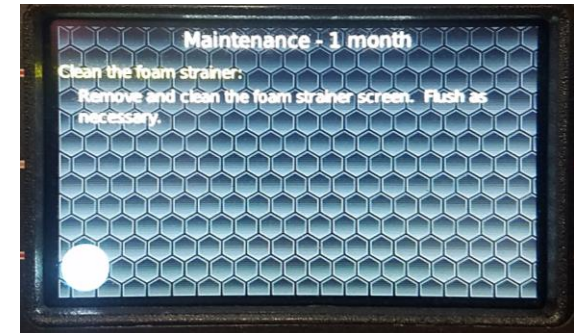
- The SmartFOAM screen will provide prompts when maintenance is required or a fault is detected
 - Use the Menu button to access the maintenance screen
 - Press the “i” icon for detailed information
- See Page 80 of the [SmartFOAM Operator Manual](#) for additional maintenance information.



Class A Foam - Maintenance

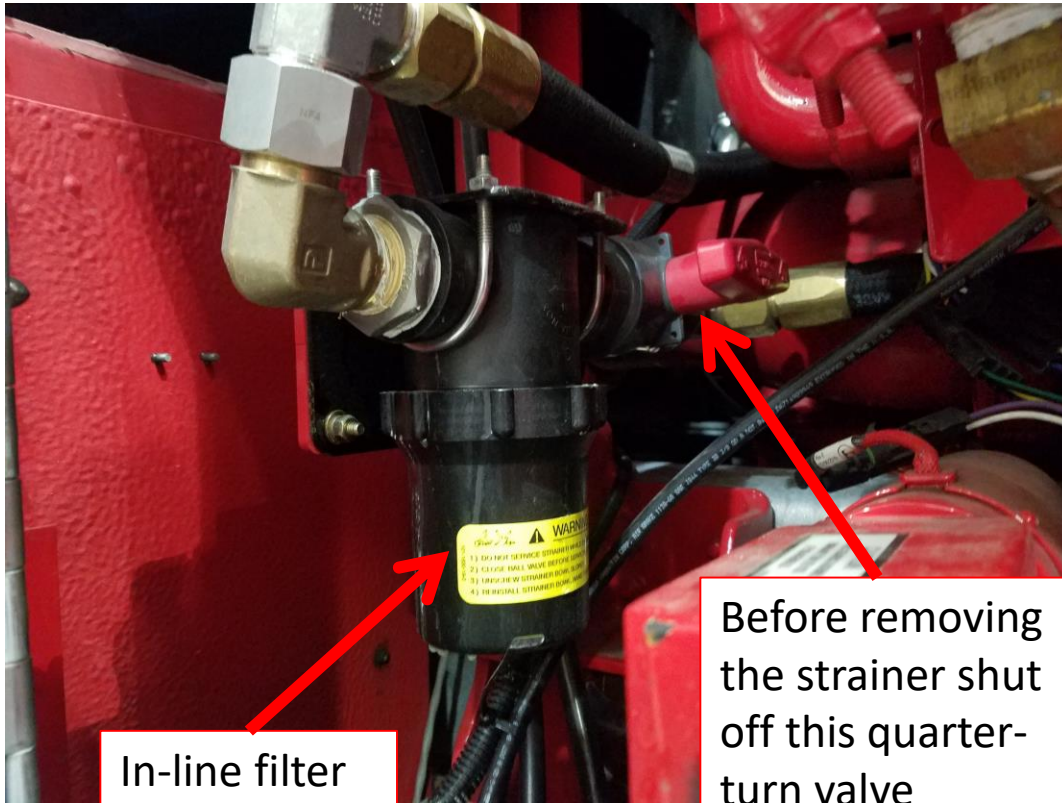


- A low pressure foam concentrate strainer is mounted in-line between the concentrate tank and the foam pump.
- Hale recommends removing and cleaning the strainer screen monthly.
 - Prompt will appear on the SmartFOAM screen
- Protects the pump from debris that might accumulate in the foam concentrate tank.
- Composite nonmetallic housing with stainless steel mesh strainer element and includes a service shut-off valve.
- Located behind the officer side pump panel near Large Diameter Discharge B



Officer side pump panel

Class A Foam - Maintenance



In-line filter assembly

Before removing the strainer shut off this quarter-turn valve



Remove the strainer and rinse

Class A Foam – Post-use

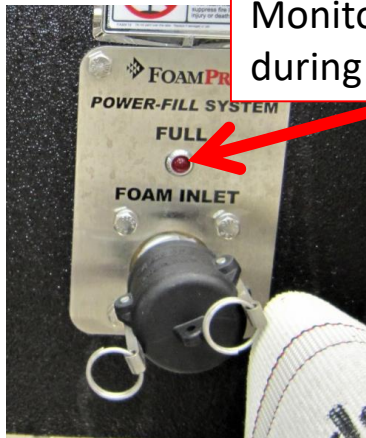


- Approved Class “A” foam concentrates do not deteriorate rapidly like Class “B” concentrates.
- System should be operated at least every 10-12 weeks.
 - Keeps the concentrate from gelling by moving concentrate through the system
 - No automatic or pre-piped method for flushing provided
 - This also fulfills the 2-month maintenance requirement
- Pump discharge, hose, and appliances should be flushed with plain water following use

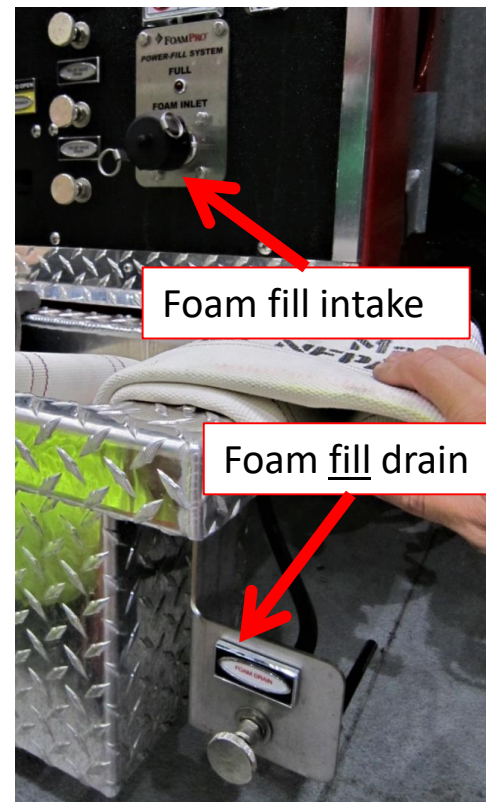
Class A Foam - Refill

- Foam refill resembles the Crimson, however there is no onboard transfer pump to intake foam concentrate
- Intake located officer side pump panel
- Bulk fill sites equipped with a transfer pump
 - **Currently only available at CMF**; future plans for Stations 17 and 26
- Must monitor the fill to avoid overflow – watch the “full” light – *there is no automatic shutoff*
- Drain for fill plumbing located in front of the hose tray below the running board
- Pouring concentrate directly into the tank at the top of the apparatus is also an acceptable option

Foam tank drain – behind a door on the curbside pump panel



Monitor this light during filling



Foam fill intake

Foam fill drain

NEVER mix Class A and B concentrates. Always verify that Class A concentrate is being used to refill the onboard tank.

Class B Foam

- There is NO integral Class B foam tank
- Class B concentrate is carried in four 5-gallon drums above the fire pump
- Class B foam requires an external eductor, 95gpm Elkhart nozzle, and foam expansion tube



Class B concentrate



Concentration	Time to Empty 5-gallons	Foam Consumption Rate
1%	5 minutes 16 seconds	1.0gpm
3%	1 minute 45 seconds	2.9gpm

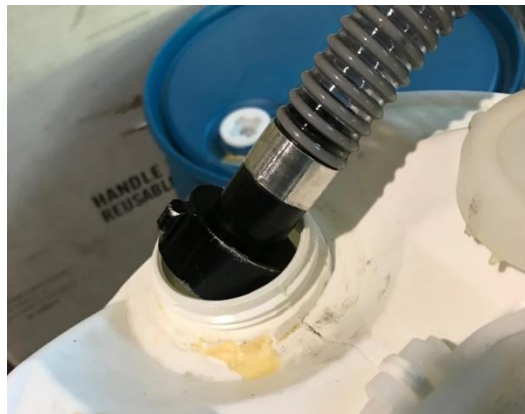
Class B Foam



- The Class B foam eductor will move from the Crimsons to the Pierces.
- The eductor pickup tube will fit into the 5-gallon pails of foam, but it has to be inserted at an angle to fit.



It won't fit this way

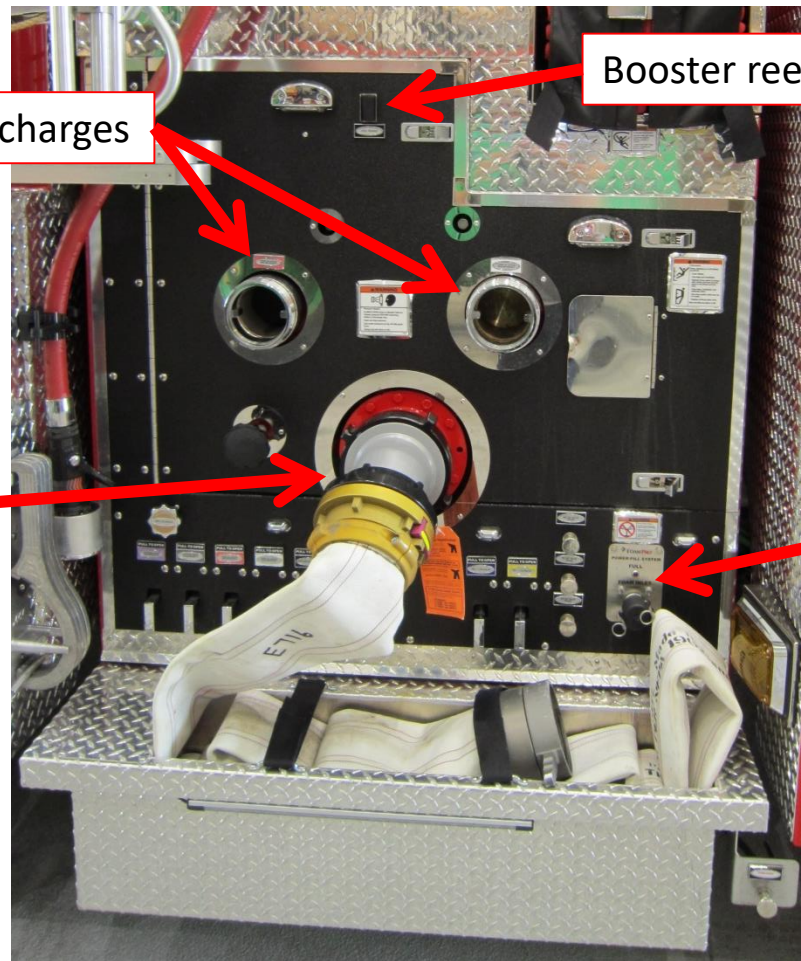


Tilt the coupling....



Tube Inserted

Pump Panel – Officer Side



Large diameter discharges

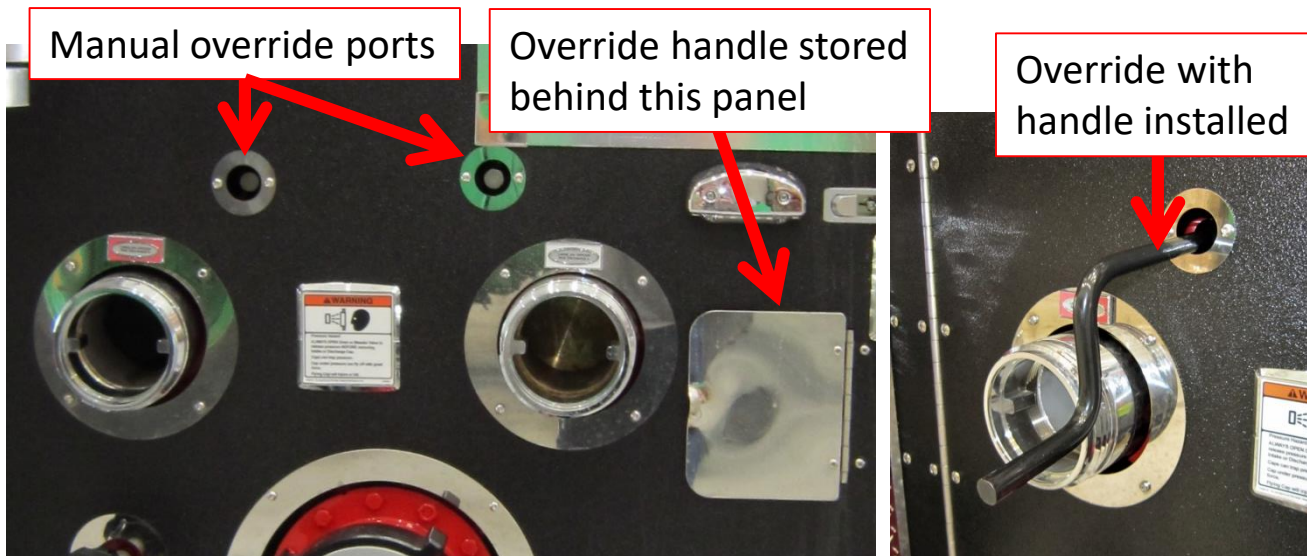
Booster reel rewind

Officer side intake w/
50' soft sleeve

Class A foam refill intake

Officer Side Discharges

- Two large diameter (4") discharges
- Controlled on the driver side panel by Akron 9323 controllers
 - Controls valve only – no flow minder or pressure display
- Akron 8840 electric operated valves with manual overrides



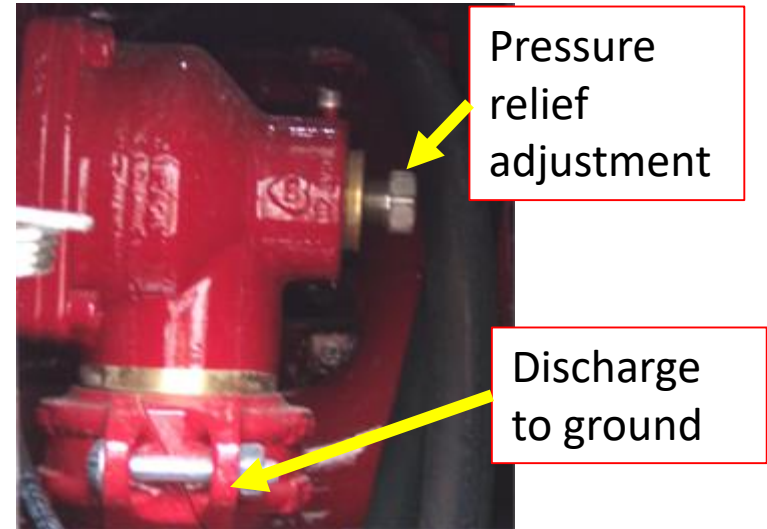
No individual pressure relief valves integral to the discharges. Pressure is controlled only by the TPM.

Turn override handle clockwise to open the valve. Slow and steady turns works best due to slow-open brake built into the valve.

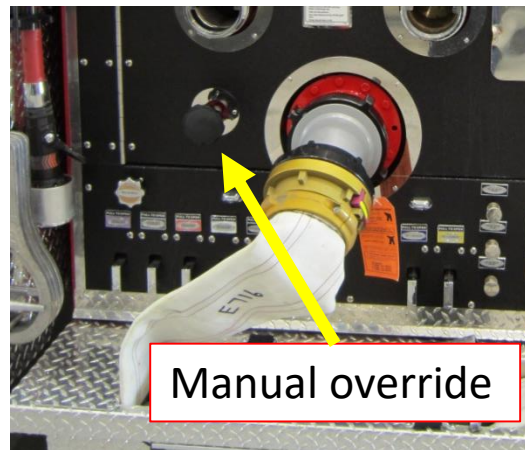
Intakes



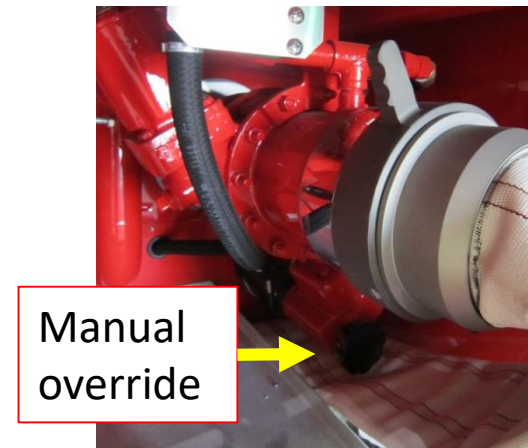
- 3 intakes – driver side, officer side, rear
- Integral relief valves
 - Factory set at 125psi
 - 75psi to 250psi operating range
- Hale MIV-E electric valves with manual overrides



Driver side

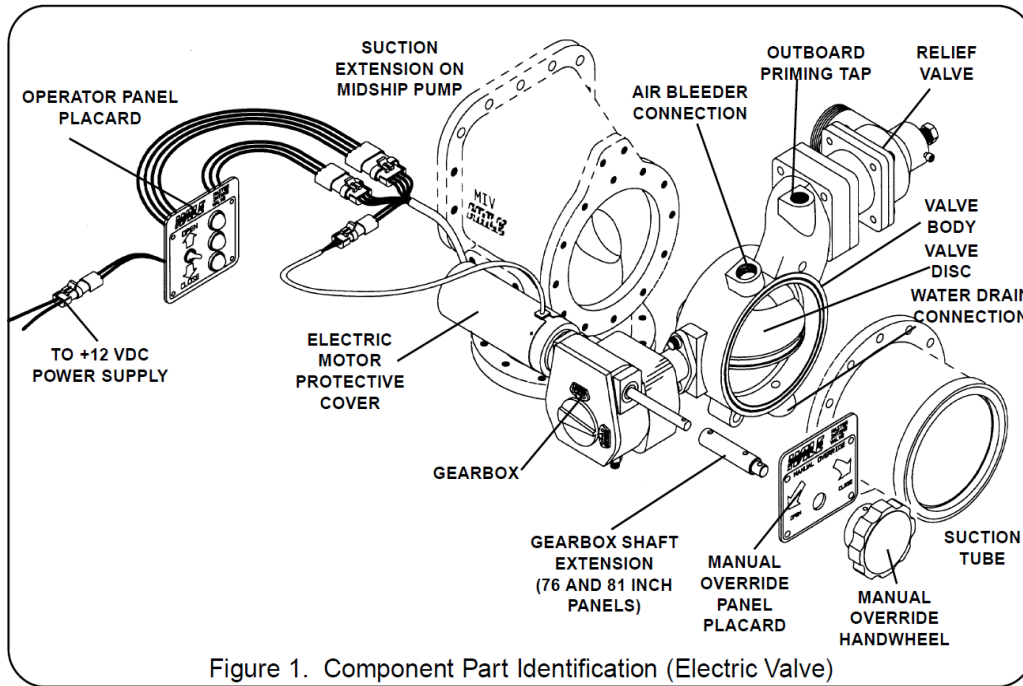


Curbside



Rear

Intakes - Maintenance



After each use:

1. Visually inspect the valve for debris caught between the valve body and valve disc.
2. If the system was operated with salt water or contaminated water, flush valve and pump with fresh water.
3. Cycle the valve to make sure the valve still operates smoothly. Apply Sunoco Ultra Prestige 2EP grease or equal to valve disc edges and to valve bore as necessary.

For additional information about the MIV, go to the [Hale MIV-E Manual](#).

Tank Valves



Tank To Pump

- Manual valve
- 3" plumbing
- Valve is connected to a reverse linkage
 - Out is closed
 - In is open

Tank Fill

- Manual valve
- NO autofill on any intakes
- 1.5" plumbing



No electronic or automatic valves associated with tank to pump or tank fill.

Hose Reel

- 200' of 1" booster line
- Elkhart Brass Chief 45gpm/100psi fog nozzle
- No individual discharge gauge
- Automatic rewind
 - Switches on both pump panels
- Blowout valve located on officer side pump panel
 - Directs pressurized air (120psi) through the reel to push water out – be sure to open the nozzle to allow air and water to escape
 - Secure the nozzle before charging with air – nozzle will whip around if uncontrolled

Be sure to blowout the reel during cold weather – components will freeze quickly.

Booster reel directed into the tank fill is a convenient means to circulate water for the pump and the reel.



Reel "drain" on officer side pump panel



Reel rewind switch



2018 Pierce Enforcer Engine

Scene and Work Lighting



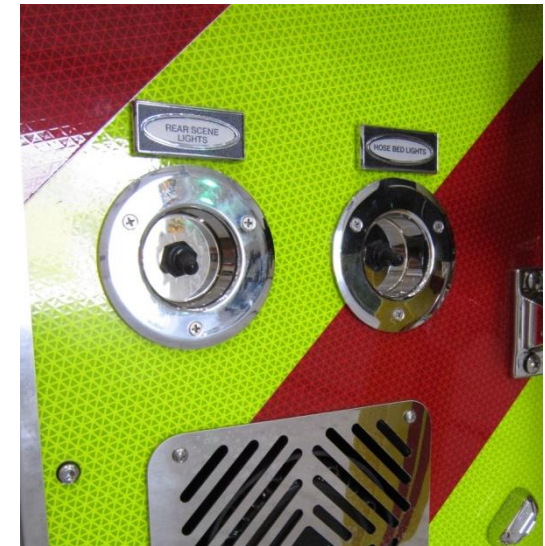
Driver's side pump panel



Officer's seat overhead



Driver's seat overhead



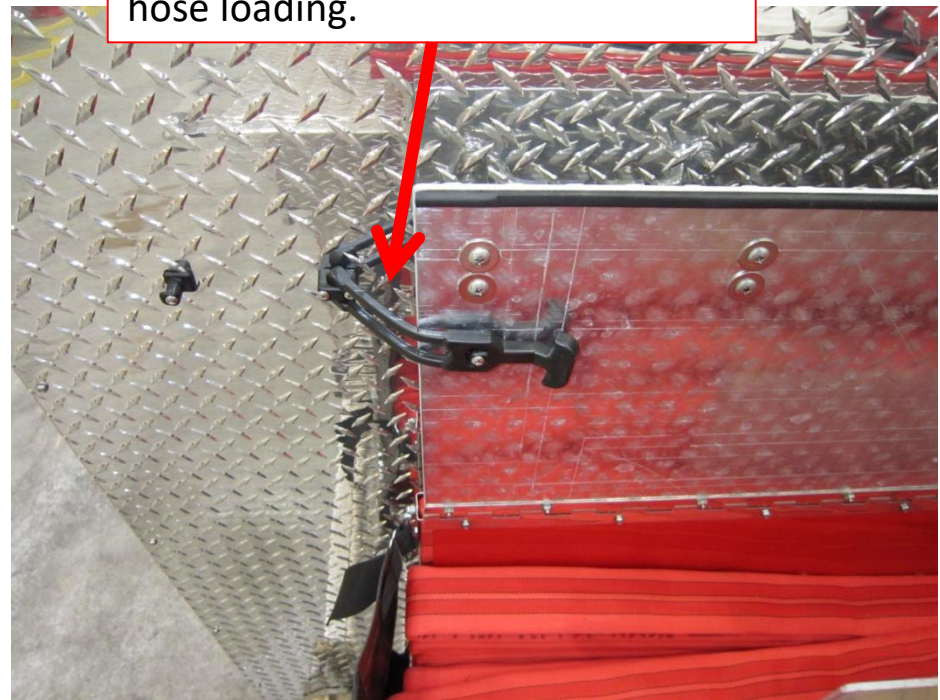
Driver's side rear body

All onboard lighting is 12v DC.

Crosslay Area



Light controlled by "cargo light" switch on driver switch panel. Also engages with hosebed lights.



Latch to secure cover open during hose loading.

Hose Loads

Crosslays

200' - 1 1/2"
150/50/7/8"

200' - 1 1/2"
150/50/7/8"

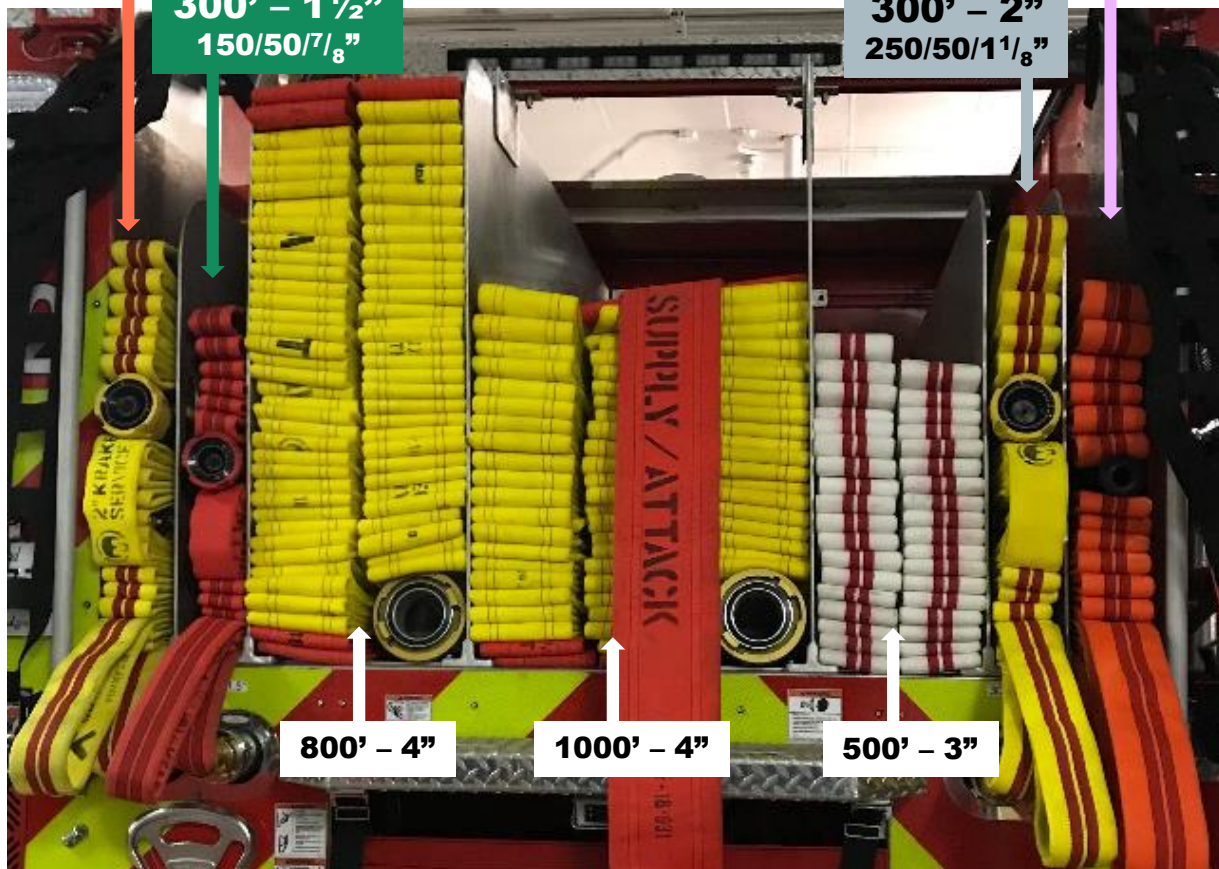


300' - 2"
250/50/1 1/8"

300' - 1 1/2"
150/50/7/8"

250' - 2 1/2"
1 1/4"

300' - 2"
250/50/1 1/8"



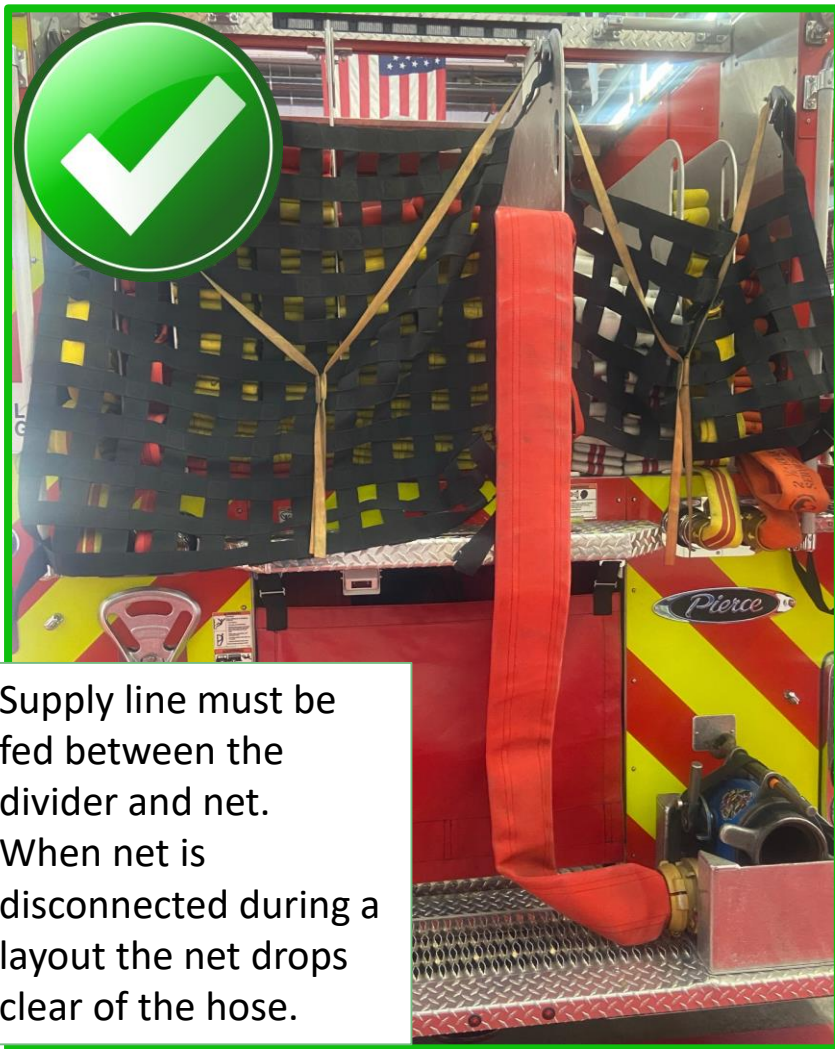
800' - 4"

1000' - 4"

500' - 3"

For information regarding pump discharge pressures go to the [Reference Chart](#).

Hose Bed - Nets



Supply line must be fed between the divider and net. When net is disconnected during a layout the net drops clear of the hose.



Supply hose draped over will damage the net or jam the buckles.

Supply hose fed below the net will become entangled during layout.

Additional Resources



This document and other supporting documents are available at <https://www.montgomerycountymd.gov/mcfrs-psta/driver/DriverTrainingPierceEnforcer.html>

Members of the apparatus committee:

- Assistant Chief Pete Friedman
- Program Manager Steve Lamphier
- Battalion Chief Frank Doyle
- Chief George Brown (Sandy Spring VFD)
- Deputy Chief John Connell (Kensington VFD)
- FF Patrick Mann
- Maintenance Crew Chief Steve Neubauer

For information regarding hose loads and nozzles contact Battalion Chief David Polikoff.